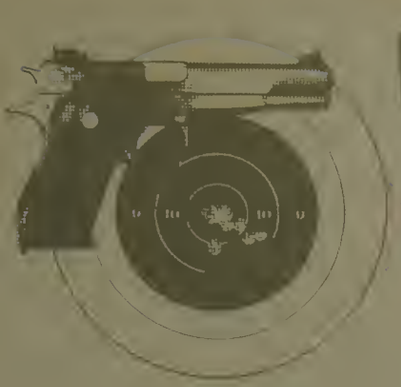

OLSON'S

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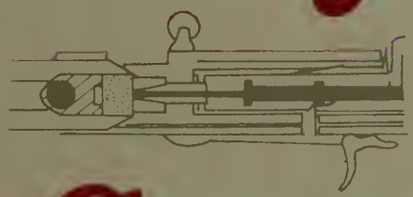

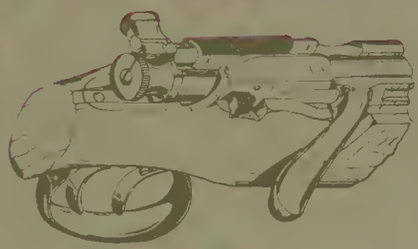

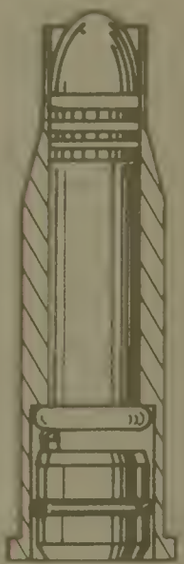

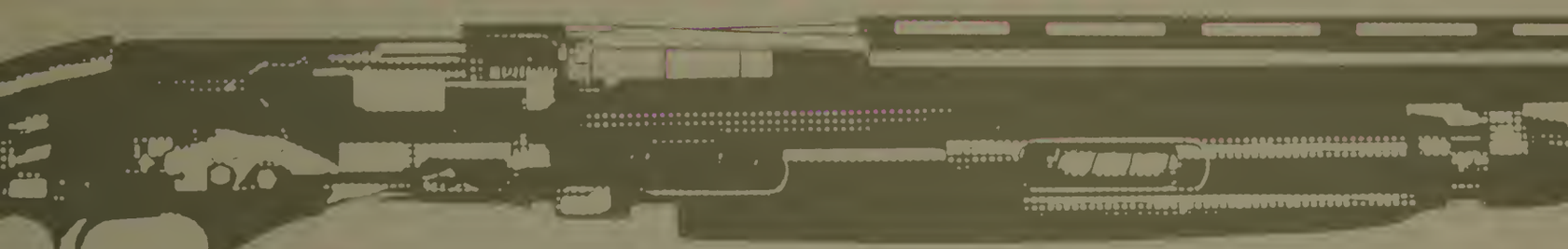

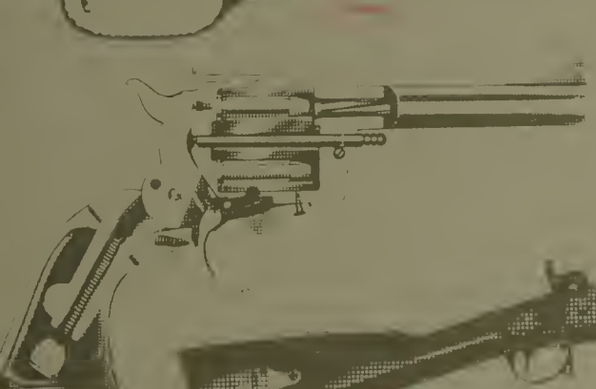

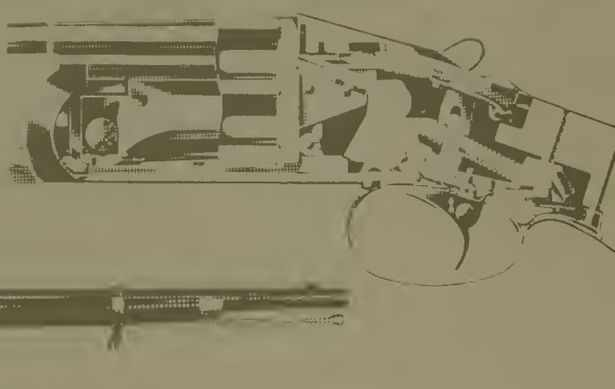

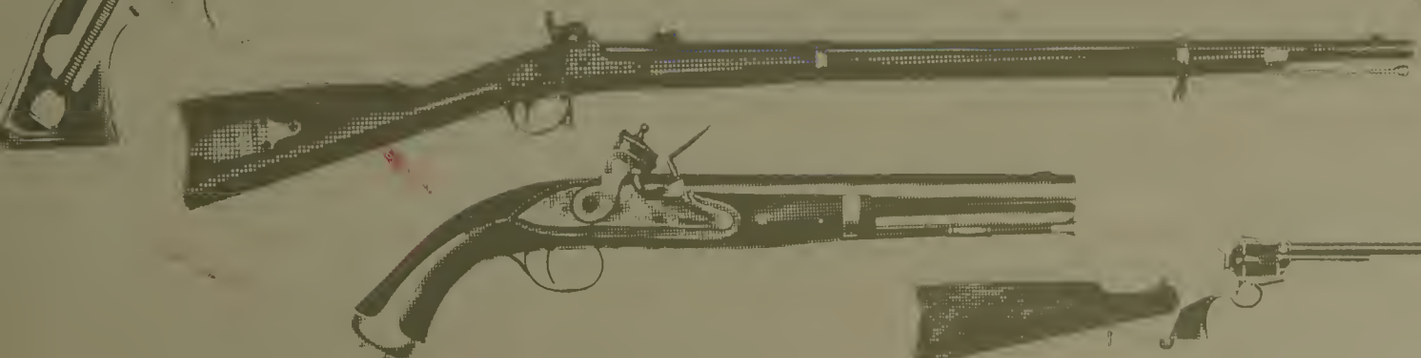

John Olson

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OLSON'S ENCYCLOPEDIA OF SMALL ARMS

John Olson

More than three decades ago, John Olson earned international recognition as the editor of the legendary *Shooter's Bible.* Then, in 1967, he decided that it was time to fill a substantial gap in firearms literature: a concise but definitive encyclopedia of small arms. Working with a distinguished co-author—Colonel Chester Mueller, an ordnance expert—he quickly accomplished the monumental task, and the following year his famous *Small Arms Lexicon and Concise Encyclopedia* was published. For years it was the standard shooter's reference, eventually selling over 220,000 copies.

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Olson's Encyclopedia of Small Arms

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This book is dedicated to the man who so diligently worked with me to create the first edition of this work back in 1967—the late Colonel Chester Mueller.

Acknowledgments

This volume required the collaboration of a vast number of knowledgeable specialists—far too many to list individually. For this, I am truly sorry. I hope that those of you who contributed so unselfishly will understand my predicament and realize that you have, nevertheless, earned my sincerest gratitude. Hank Goodman of Hopkins & Allen Arms Company, deserves special mention, for granting me the privilege of using any of the illustrations found in his now famous tome, "The Muzzle-Loader's Manual".

A

Aberration in optics, the deviation of light rays from a single focus, or, the convergence to a different foci by means of a mirror or lens of light rays coming from a single point. Its effect is to lessen the distinctness of images.

Abrasion the wearing away of a surface by friction. Caused in the bore of a gun by use of improper cleaning materials as well as the normal effect of bullets pressing through the bore.

Abrasive a substance used to wear away a surface by friction. It may be either a natural or artifical substance and, may be used in making grinding wheels, abrasive cloth, abrasive paper, etc. Natural abrasives such as emery and corundum have been largely replaced by artificial abrasives of the silicon carbide or aluminours types.

Absolute deviation the distance between the center of the target and the point where a projectile hits or bursts.

Absolute error 1. the shortest distance between the center of impact of a group of shots and the point of impact of a single shot. 2. the error of a sight in relation to a tested, correctable, master service sight.

Abutment the block or framework at the rear of a cannon that receives the rearward thrust of discharge.

Acacia (uh KAY shuh) an American tree yielding a wood similar to American black walnut in weight, color and density. It is very hard and durable — often mistaken for walnut. Until recently it has been little used for gunstock work, however the growing scarcity of walnut has enhanced its importance to the firearms industry.

Acanthus (un KAN thuhs) an engraver's and woodcarver's ornamentation, patterned after the acanthus plant which is common to the Mediterranean region.

Accelerate to speed up or cause to go faster, thus a projectile from its stationary position in a gun barrel is accelerated by the rapidly expanding gases of the explosion of the propellent powder to the velocity attained at the muzzle.

Acceleration the change of velocity (speed), or the rate of such change.

Acceleration of gravity the rate of change of velocity caused by the action of gravity upon all freely falling bodies, usually expressed in feet per second. At sea level, latitude 45°, it is 32.174 feet per second. See "bullet drop."

Accelerator a part of the mechanism of certain types of automatic weapons that speeds up the action. In chemistry it is a substance that hastens a reaction, such substance being called catalyst.

Accuracy freedom from error. In firearms it is dependent upon the design of the weapon and the ammunition; in the use of firearms upon the shooter, weather, terrain, and target. In the case of shotguns, even distribution of the shot pattern is rated over accuracy in evaluating the result.

Accuracy life estimated average number of rounds that may be fired in a particular gun before it becomes inaccurate because of normal wear.

Accuracy of fire the closeness of a grouping of shots around their center of impact.

Accuracy of practice a measure of the precision of fire in terms of the distance of the center of impact from the center of the target. Also called accuracy of the shoot. A term more commonly used in artillery firing.

Accurize the process of reworking a rifle or handgun (usually a pistol) by smoothening and tightening certain critical parts; improving trigger pulls, sighting instruments and rebedding rifle barrels in their stocks. A skilled gunsmith can often achieve dramatic improvement in the accuracy of a firearm so processed.

Achromatic (ACK-row-MATic) in optics, refracting

light, giving images almost entirely free from extraneous colors.

Achromatic lens a lens consisting of two joined glass elements, free of chromatic aberration or color fringes in the image.

Acids substances whose molecules ionize in water solution to give the hydrogen ion from their constituent elements. The strength of an acid is proportional to the concentration of hydrogen ions present. Acids are characterized by their sour taste and ability to redden litmus, a dyestuff.

ACP (A.C.P.) abbreviation for "Automatic Colt Pistol."

Acraglas the registered trademark for Bob Brownell's chemical bonding or "bedding" compound. Mixed with a catalyst and a coloring agent, the paste mixture is strategically applied to the barrel and receiver channels of the rifle stock. Designed to improve the accuracy of a given rifle, the application of this, or other similar preparations, is generally termed "glass-bedding".

Action the breech mechanism of a firearm by which it is loaded, fired and unloaded. The term action is broader than the term lock which designates only the firing mechanism, not the loading and unloading mechanism.

Action bar flats See "water table."

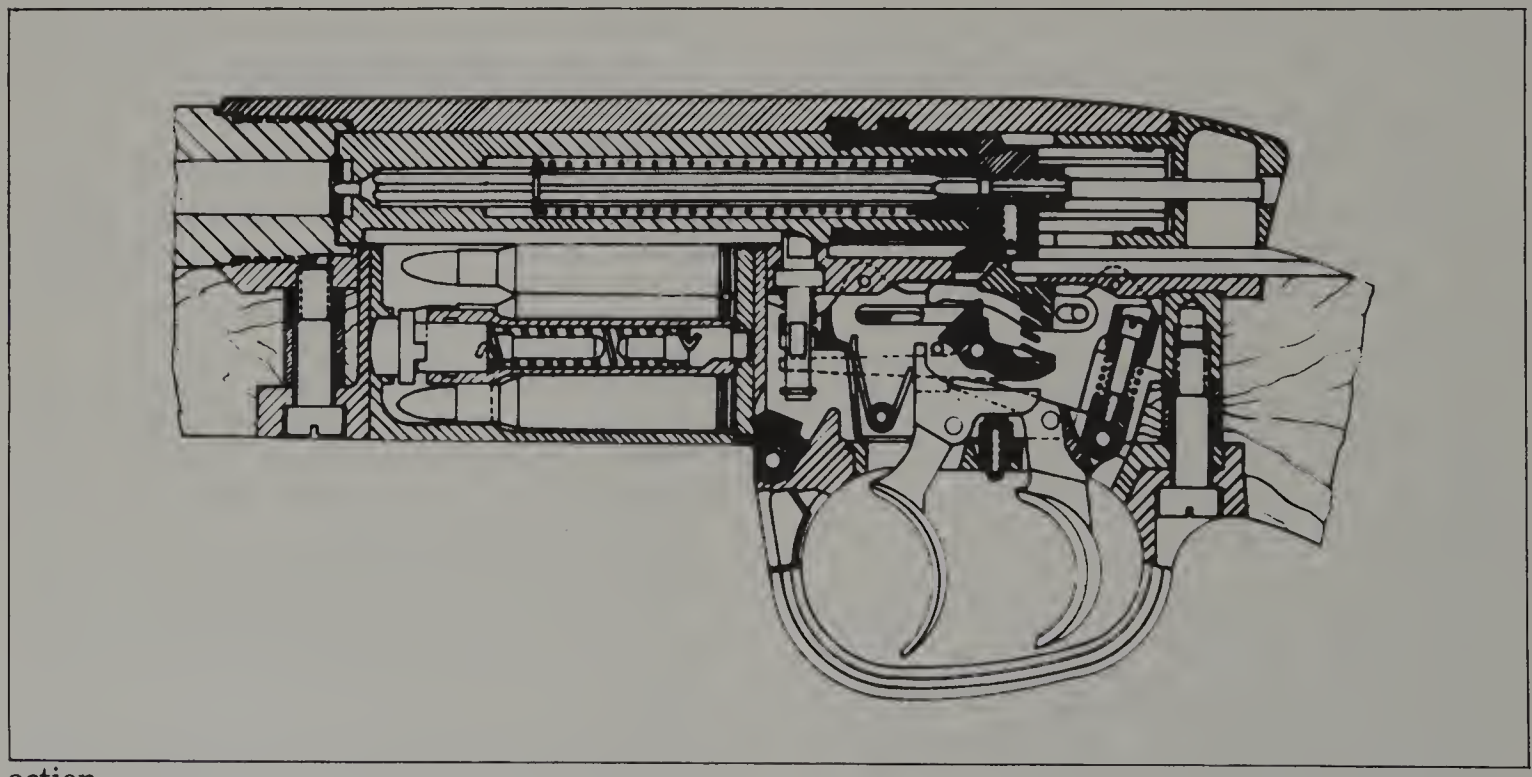
Action shortening the practice of shortening a bolt action rifle receiver by removing a portion of the rails between the forward receiver ring and the rear receiver bridge and by welding the remaining portions of the rails together again. Appropriate changes are then made in the length of the bolt and its' components. Once a common practice of highly qualified gunsmiths who sought to tailor large actions to cartridges that were considerably smaller than those for which the actions were originally intended.

Actuator part of the receiver mechanism in certain types of automatic weapons: trigger actuator. The actuator slides forward and back in preparing each round to be fired.

Adams, Robert an English inventor and gunmaker, best known for the solid frame, double action percussion revolver he patented in 1851. It was the first successful solid frame revolver and afforded England means for competing with the U.S. Colt revolver.

Adapter 1. a part or piece to permit parts of different size or shape to be fitted together. 2. a part that modifies a weapon for a different use. For example, adapters used with a 45 calibre pistol enables its use with .22 calibre ammunition. 3. grip adapter — a device frequently employed on revolvers or automatic pistols to enlarge the gripping surfaces.

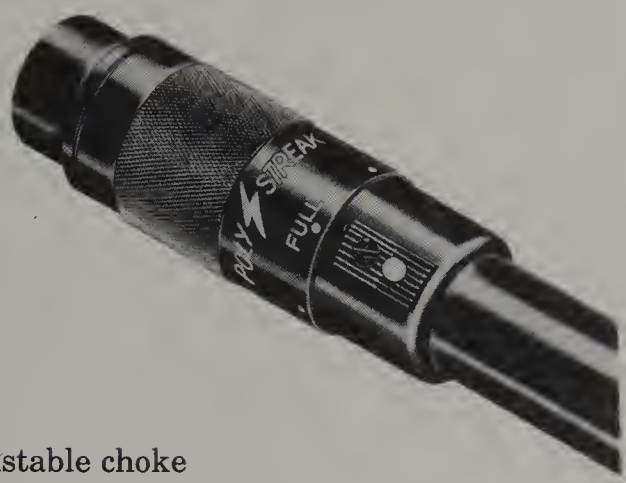
Adhesion and friction adhesion is the sticking to-



action

gether of two substances in contact with each other, while friction is the resistance to the relative motion between two bodies in contact with each other. Adhesion is independent of the pressure between contacting bodies, while friction increases with pressure. Lubricants increase the adhesion and decrease the friction. This is noticeable in handling small, oiled gun parts that tend to cling together but may readily be slid over each other.

Adjust to correct the sighting of a gun so that its projectile will hit the target.



adjustable choke

Adjustable choke may refer to any means used to vary the choke of a shotgun but more properly refers to a single adjustable device mounted on and as an extension of the muzzle by which the choke may be varied.

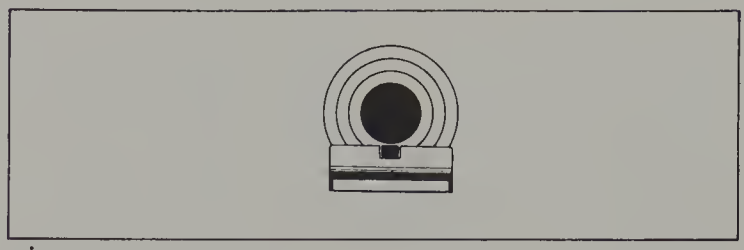
Adjusted elevation after observation of fire. The correction of the elevation of a gun to cause its projectile to hit the target. A term used in artillery firing.

Adjusted range the range of a gun corrected by observation of fire so that succeeding shots will hit on or close to the target. It is a term commonly employed in artillery firing.

Adjustment fire gunfire utilized for the purpose of obtaining information upon which correction of fire may be made. It is a term commonly employed in artillery firing.

Adjustment of fire the correction of the setting of the gun, or the setting of the fuze of an artillery projectile, to bring the projectile on target. It is a term commonly employed in artillery firing.

Afghan stock a type of stock characterized by its deep curve and unusually high, narrow butt, found on crude muzzleloading guns when British troops, in the 1840's, entered Sind, then a province of Afghanistan and now a part of West Pakistan. The name Afghan was applied although the jezail, another stock



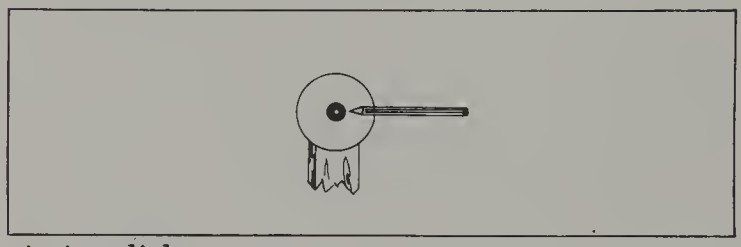
aim

type, was more commonly used in Afghanistan proper.

Aggregate match a score found in target competition by totaling the scores from two or more match stages or individual matches.

Aim to align the sights of a weapon on a target.

Aiming circle an instrument used for measuring horizontal and vertical angles in artillery and machine gun fire.



aiming disk

Aiming device an attachment for a firearm for correcting its sight alignment. Also used in training to enable the instructor to detect errors in the sight alignment of a firearm.

Aiming disk a rigid circular disk with a bull's-eye and a pinhole in its center, attached to the end of a wooden staff. It is used for instruction purposes in sighting and aiming.

Aiming group the pattern made on a surface by a series of marks, to test the ability of a trainee to properly sight a gun. The trainee directs an aiming disk to be moved over a surface until it is aligned, in his judgment, with the sights of a fixed firearm. The position of the disk is marked by making a pencil dot on the surface through the hole in the disk. Three such marks will constitute an aiming group.

Aiming point 1. the target when it can be seen by the shooter. 2. a point both fixed and visible if he cannot see the target, sometimes called the auxiliary aiming point, which he can use to direct his fire at the unseen target.

Aiming post a stake used as an auxiliary aiming point in obtaining the proper direction and elevation of a gun. Sometimes also called aiming stake. It is a term commonly employed in artillery firing.

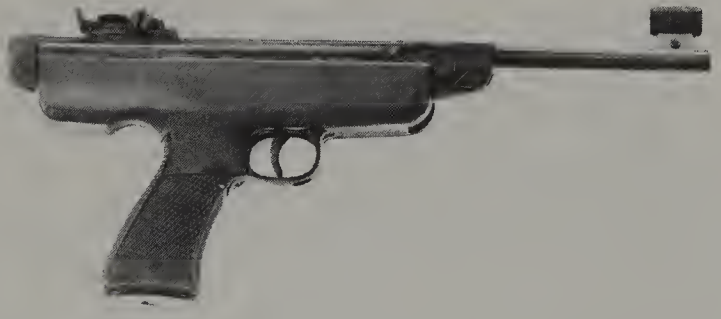
Aiming silhouette (SILL o et) a target outlining the form of an animal or man for use in small arms practice.

Aiming stake See "aiming post."

Air a mechanical mixture of gases composed by volume of 78 per cent nitrogen, 21 per cent oxygen, and 1 per cent argon. At 32 degrees Fahrenheit and 14.70 pounds per square inch pressure, pure air weighs 0.08073 pounds per cubic foot. At the same temperature and pressure, a pound of air occupies 12.387 cubic feet.

Air gun a term loosely used to designate a gun that uses the pressure of compressed air or a gas to propel a pellet or BB. Technically an air gun uses only air, a gas gun uses a gas other than air, such as carbon dioxide (CO_2). Originally called wind guns in the 17th and 18th centuries; use of the term air gun began about 1800. Air as a propelling force for a projectile was known in ancient Egypt and, over the succeeding years, various methods were employed to compress, store, and discharge air from a gun, to propel one or more projectiles with a single "loading" of air.

Air hardening steel the discovery by Robert F. Mushet in 1868 that a steel allowed to cool slowly in air rather than quenching was harder as a result, led to modern high-speed production. Also called mushet or self-hardening steel.



air pistol

Air pistol a hand gun using compressed air or a gas to propel a pellet or BB from its barrel.

Air resistance the resistance of air to the passage of a projectile through it. It is one of two principal forces that act upon a projectile after it leaves a gun, the other being gravity.

Air rifle a rifle using compressed air or a gas to propel a pellet or BB from its barrel. As early as 1750, a 13-shot compressed air gun, 31 inches long, with its stock serving as an air flask, was designed by Contriner of Vienna.

Air space the space in a loaded cartridge case that is not occupied by the propellent powder or the bullet.

Air speed the speed of a projectile with reference to the air through which it travels instead of with reference to the ground over which it passes.

Air spiral a term used to describe the imperfect flight of a bullet through the air caused by its unbalanced form, i.e., its center of gravity is not coincident with its center of form. The flight may be likened to a corkscrew path through the air. Other terms used to describe an imperfect flight are "wobble" and "tipping."

Air target any target in the air that may be fired on from an aircraft or from the ground.

A.I.S.I. abbreviation for American Iron and Steel Institute.

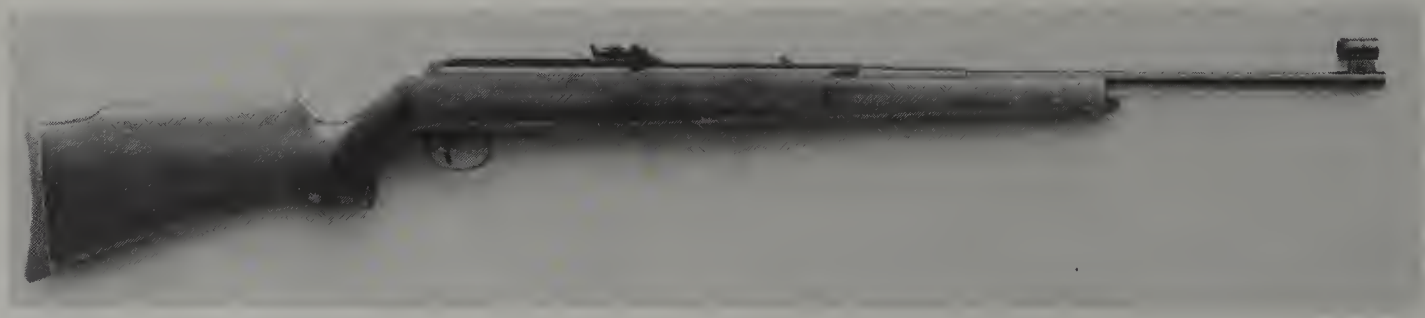
Alarm gun a term once in general use to describe a gun that fired blank cartridges. A typical gun so called is the American Cartridge Alarm Pistol, patented in 1874, firing a blank .22 caliber rim fire cartridge.

Alibi in target shooting, a circumstance which, under applicable range rules, nullifies the shooter's score and permits him to fire a substitute round.

Align, aline to bring into line, such as lining up the front and rear sights of a gun.

All-around traverse turning a gun horizontally in a complete circle without changing the position of its tripod or mount.

Allen, Ethan (1808–1871) a New England gunsmith and inventor, who was successively in the firms called Allen & Thurber, Allen & Wheelock and Ethan Allen & Co. He is famous for his inventions relating to the pepperbox pistols, his earliest being patented in 1845. At one time these pistols were more popular than the Colt revolver. He was not the Ethan Allen of Revolutionary War fame.



air rifle

Allen & Wheelock the name associated with a single shot rifle, firing a rim fire cartridge, made by the company of that name and used during the Civil War.

Allin, Erskine S. (1809–1879) an American gunsmith and designer whose entire working life was spent at Springfield Armory. His best known design was the breechloader conversion for the muzzleloader (and its subsequent refinement for new guns) that was incorporated in United States military long guns until 1892. Conversions were started with U.S. muzzleloaders in 1865 and consisted of removing a section of the breech and replacing it with a hinged breechblock containing a latch, a firing pin, and an extractor. With the substitution of a new hammer for the old one, the gun thus became a single shot breechloader.

Allowance means the dimensional latitude permitted between parts that are designed to fit each other. The allowance depends on the class of fit desired such as a forced fit, running fit, etc., and is important in the design of firearms. It should not be confused, as it often is, with "tolerance" which is the dimensional latitude provided in the manufacture of a part.

Alloy an intimate mixture of two or more metals melted together to form, for all practical purposes, a new metal. For example, brass is an alloy composed principally of copper and zinc, sometimes containing small amounts of lead and iron.

Altimeter (al TIM it er) an instrument for measuring altitude. For effect of altitude on sighting a firearm see "altitude."

Altitude the perpendicular elevation of an object above a designated level surface such as sea level. Contrary to popular opinion, variations in atmospheric density have little or no effect on sighting or trajectory, according to a noted authority.

Alumina the common name for the chemical aluminum oxide which occurs naturally as the mineral corundum. Used as an abrasive, it constitutes a large part of emery. Wheels made from alumina are recommended for grinding metals having a high tensile strength, such as steel.

Aluminum, aluminium a bluish silver-white metal characterized by its lightness and resistance to oxidation. Aluminum castings are employed in the manufacture of small arms and, when so used, aluminum is alloyed with other metals.

Amalgam an alloy of mercury with one or more metals.

Amateur Trapshooting Association a national organization of those interested in trapshooting, founded 1923, and having headquarters in Vandalia, Ohio. Responsible for the rules, shooting procedures and handicapping of American trapshooters. Abbreviated as ATA.

Amatol (AM a toll) a high explosive made of a mixture of ammonium-nitrate and TNT, used as a bursting charge in high explosive projectiles.

American Enfield See "Enfield, American."

American Iron and Steel Institute a national organization of individuals and basic manufacturers in the steel industry founded in 1908, having its headquarters in New York City. Its steel specifications are a standard for the industry.

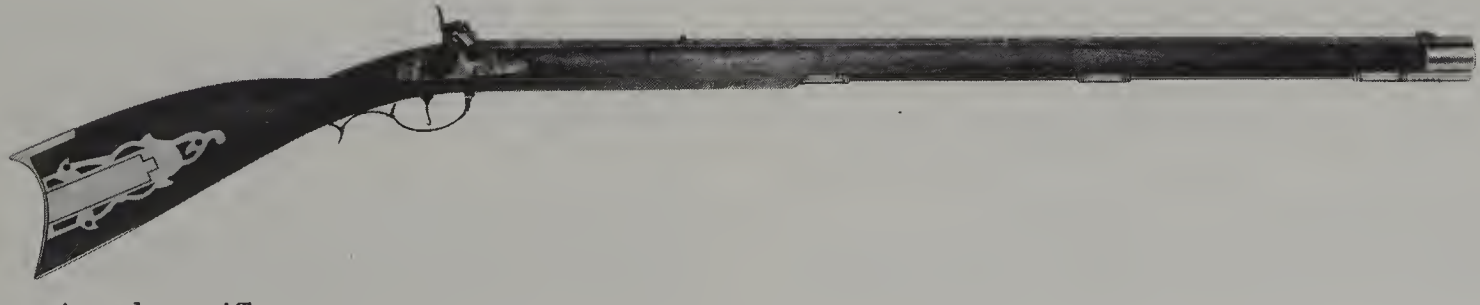
American long rifle the term sometimes applied by gun collectors to the muzzleloading rifle usually referred to as the Kentucky or the Pennsylvania rifle.

American Ordnance Association a patriotic, educational, scientific, non-political and non-profit making organization of American citizens dedicated to scientific and industrial preparedness for the common defense. Founded in 1919, its headquarters is located in Washington, D.C. It publishes the bimonthly magazine "Ordnance."

American Primer See "Boxer primer."

American Rifleman, The the official journal of The National Rifle Association, published monthly for its members.

American Single Shot Rifle Association founded in 1946 and composed of persons interested in single



american long rifle

shot rifles of the period between the Civil War and World War I. Headquarters are in Berwyn, Illinois.

American Society for Testing Materials abbreviated as ASTM, or A.S.T.M., founded in 1898 to promote the knowledge of materials of engineering and the standardization of specifications and testing methods.

American Society of Mechanical Engineers a national organization of engineers founded in 1880 and having its headquarters in New York City. It has codified steel specifications which are published and known as ASME specifications.

American Standards Association abbreviated as ASA, founded 1918 to serve as a clearing house for voluntary coordinated national efforts to establish standards in safety engineering and industry covering a wide range of applications within these areas.

American Walnut (Juglans Nigra) wood from the American Black Walnut tree which may be found throughout the continental United States. Varying greatly in quality, American Walnut in the better grades is an ideal gunstocker's wood because it is hard, strong, close-grained and easily worked. When quartersawn from a stump cut, American Walnut often has spectacular figuring and results in an unusually attractive stock for rifle or shotgun.

Ammo the popular abbreviated expression for ammunition.

Ammonal (AM uh NALL) a high explosive made of a mixture of ammonium nitrate, TNT, and flaked or powdered aluminum, used as a bursting charge in a high explosive projectile and producing a bright flash on explosion.

Ammonium chloride See "sal ammoniac."

Ammonium picrate See "explosive D."

Ammunition a generic word covering the materials used in discharging every kind of firearm or weapon that hurls a projectile. Including, but not limited to, powder, shot, bullets, shrapnel, cartridges, primers, fuses, bombs, grenades, mines and pyrotechnics. Ammunition is classified in many ways, — by composition, size, intended use, effect, etc.

Ammunition bag a bag usually of canvas, containing pockets in which a supply of ammunition may be carried.

Ammunition belt 1. a fabric or metal band with loops for cartridges that are fed from it into a machine gun or other automatic weapon. In this meaning, usually called a "feed belt." 2. a belt with loops or pockets for carrying cartridges or clips of cartridges. In this meaning, usually called "cartridge belt."

Ammunition clip See "Cartridge Clip."

Ammunition data card a card put into a box or container of ammunition to identify it by type and composition and in some cases to furnish instructions for handling.

Ammunition dump a temporary storage place for military ammunition in a combat zone.

Ammunition lot number a code number identifying a particular quantity of ammunition with its manufacturer. The number is assigned to each lot of ammunition when it is manufactured. Particularly important to target shooters who wish to avoid any possible minor variation in loads when in competition.

Amusette (AM you SET) an early breechloader, mounted like a cannon but fired like a musket. Made of brass and firing a half-pound ball.

Anemometer (AN i MOM i ter) an instrument for measuring wind pressure or velocity.

Angle the space between two lines that come to a point, specifically the measure of the distance one line would have to be rotated about such point to make it lie on the other line. The measure of an angle may be made in degrees, minutes, and seconds or in mils. See "mil."

Angle of approach the angle between the line along which a moving target is traveling and the line along which a gun is aimed. A term commonly used in artillery firing.

Angle of clearance the angle between the line along which a gun is aimed at a target and the line along which the gun should be aimed in order for a projectile fired from it to clear any obstruction between the gun and the target. A term employed in artillery firing.

Angle of convergence the angle formed by the intersection of the lines of sight from the two eyes of the observer, from the two eye pieces of an optical instrument, or from two points of observation. Also called angle of parallax.

Angle of deflection the angle between the axis of the bore of a gun and the line of sight when the gun is laid for direction. A term used in artillery firing.

Angle of departure the vertical angle between the line from the muzzle of the gun to the target and a line along which the gun is pointed at the instant the projectile leaves the muzzle.

Angle of depression the angle between the horizontal and the line along which the gun is pointed when it is pointed below the horizontal. Also called negative angle of site or depression angle. A term employed in artillery firing.

Angle of elevation the vertical angle between the line from the muzzle of the gun to the target and the axis of the bore. Also simply called "elevation."

Angle of fall the angle at which a projectile falls. It is the angle between the tangent to the trajectory at the level point and the base of the trajectory.

Angle of impact the acute angle between the tangent to the trajectory at the point of impact of a projectile and the plane tangent to the surface of the ground at the point of impact. Thus, it is the angle at which a projectile strikes the ground or a target.

Angle of incidence it is the acute angle between the tangent to the trajectory at the point of impact of a projectile and the perpendicular to the surface of the ground at the point of impact. Thus, it is the complement of the angle of impact.

Angle of jump the angle formed between the line along which a gun is aimed just before firing and the line along which the gun is pointed at the instant the projectile leaves the muzzle. Also termed "jump."

Angle of parallax (PARA lacks) See "angle of convergence."

Angle of position also called angle of site or just "site." A term common to artillery firing.

Angle of site the vertical angle between the horizontal and a line joining the target and the muzzle of a gun. Also called "angle of position" or just "site." A term common to artillery firing.

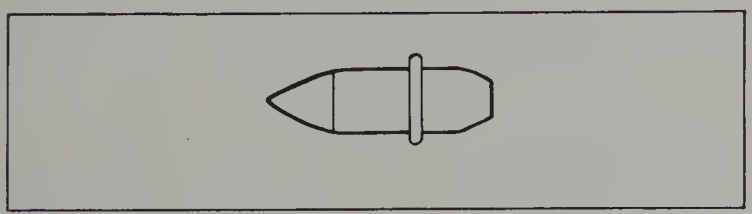
Angle of traverse the horizontal angle through which a gun can be turned on its mount.

Angstrom (ANG strom) a unit of measurement of the wave-length of light, equal to one ten-millionth of a millimeter, or .00000001 centimeters, about 4 one-billionths of an inch.

Angular magnification an increase in the apparent size of an object by optical means.

Annealing a process to soften metal involving the heating and, usually, relatively slow cooling of a metal to change certain of its properties — the exception being brass which must be cooled rapidly in the annealing process.

Annie Oakley a free pass. The resemblance of a punched free pass to a playing card with its spots shot through. One of the stunts performed by Annie Oakley Butler (1860–1926), a famous rifle shot who travelled for 17 years with Buffalo Bill's Wild West Show.



annular rim

Annular rim 1. a circular rim. 2. a ring containing a primer composition encircling the body of a Crispin cartridge ahead of its base (year 1865) that not only acted as a primer but as a gas check. The charge was ignited when the firing pin struck any point on the ring. Thus the fulminate was presented for activation by the firing pin irrespective of the seating of the cartridge.

Anodizing an electrolytic process that causes the anodicoxidation of a non-ferrous metal thereby protecting it from corrosion.

Anschutz sporting and match rifles known by the name of their German manufacturer.

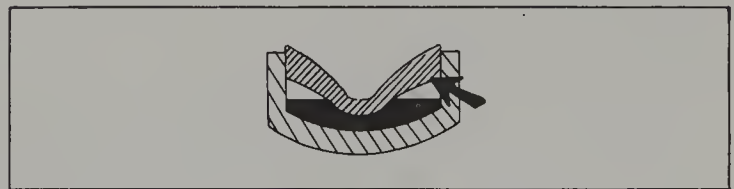
Anson fastening, forend a method for fastening the forend to side-by-side double barrelled shotguns developed by William Anson, an English gun designer, in 1872.

Anticorrosive resistant to corrosion. In firearms, the resistance to the effect of acids on the metal parts of a gun or the quality of protecting against corrosion of such parts.

Antigallic brown (ANT i GAL ick) a process for rebrowning antique firearms. Antigallic brown consists of a mixture of antimony trichloride, ferric chloride crystals, gallic acid and distilled water.

Antimony a brittle lustrous white metal element whose chemical symbol is Sb. When added to lead or a lead alloy it adds strength and hardness. A small quantity, say two-tenths of one percent, added to lead, produces lead shot composition.

Antique (an-TEEK) old or ancient. Firearms manufactured prior to 1900 A.D. are generally considered antique although certain firearms laws may, for law enforcement purposes, specify otherwise. An example of such a law is the Gun Control Act of October 22, 1968 wherein it states, "the term 'antique firearm' means — (A) any firearm (including any firearm with a matchlock, flintlock, percussion cap, or similar type of ignition system) manufactured in or before 1898: and (B) any replica of any firearm described in subparagraph (A) is such replica — (i) is not designed or redesigned for using rimfire or conventional centerfire fixed ammunition, or (ii) uses rimfire or conventional centerfire fixed ammunition which is no longer manufactured in the United States and which is not readily available in the ordinary channels of commercial trade."



anvil

Anvil a rigid metal part of a primer assembly against which the priming charge is compressed by the blow from the firing pin against the primer cap.

AP abbreviation for armor piercing or automatic pistol.

Apache pistol (uh PASH) a combination of a revolver, metal knuckles and a dagger or knife. It had been the favorite weapon of the Parisian gangster called an apache, pronounced in French as shown here.

Aperture an opening or hole such as found in a peep sight.

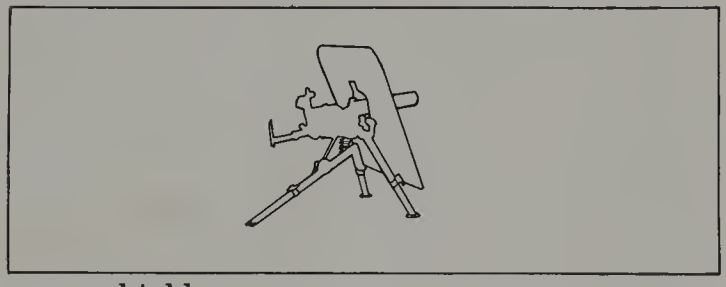
Aperture sight a metallic sight, usually a rear sight having a small hole to look through in aiming the gun to which it is affixed. Also called a "peep sight."

Apogee (AP o gee) the highest or farthest point in the orbit of an object, generally one flying in space. It is the opposite of perigee.

Appeal a procedure employed in target shooting when a competitor feels he has been improperly classified or excessively handicapped. The competitor appeals for re-classification to the officials of the match and/or to the protest committee of the organization sponsoring the match.

Apple wood (genus Malus) the wood from any one of the many varieties of apple-bearing fruit trees. The heartwood of the apple tree has many desirable stock-making characteristics but, because it is not widely marketed, it is seldom used by stock makers. Apple wood is durable, close-grained and attractively dark red-brown in color. It is easily carved and checkered.

Approaching target a target moving towards the shooter.



apron shield

Apron shield a shield of steel attached to an artillery piece to protect the gunners.

Arabesque (ARR ah BESK) a pattern of ornamentation practiced by European gun-engravers. Originating with the Moorish influence in Spain, this form of engraving employs a highly complex geometric design consisting of interlaced scrolls occasionally accompanied by floral patterns.

Arbor a tool used in gunsmithing, being a shaft or bar for holding cutting tools.

Arc welding See "welding."

AR-15 the registered trademark of Colt's, Inc., used on the .223 caliber rifle. The U.S. Military version of which is the M16 officially designated as the U.S. Rifle 5.56 mm, M16. Developed by the Armalite Division of the Fairchild Engine and Airplane Co., Colt's Inc. was licensed to produce the rifle, with first deliveries ordered for 1959 by the Army. The AR-15 is a development of the AR-10, an earlier model designed by Armalite.

Arisaka (arih SACK ah) the popular name for the Japanese Army's Type 30, 6.5 mm (1897) rifle, Type 38, 6.5 mm (later 7.7 mm) official rifle from 1906 to 1945, and the Type 44 (1911) cavalry carbine.

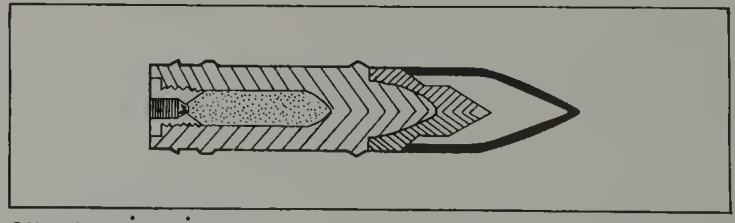
Arkansas Stone a natural stone of pure silica used as a means for sharpening fine tools and finishing metal parts such as sears, triggers, etc. Used with oil or water.

Arm 1. a weapon designed for sporting purposes. 2. a weapon for use in war and in this meaning usually called arms. 3. to supply with a weapon or weapons. 4. to put a fuze in a bomb or projectile in condition to cause it to explode at a designated time or at impact.

Armament the total of the arms and weapons with which an instrumentality of war may be equipped.

Armed one who is carrying a weapon for offense or defense. In the middle ages and up to the 17th century, one who was wearing armor. A man without armor, although carrying a weapon, was said to be unarmed.

Armor, armour a protective covering for individuals or ships, tanks, vehicles, etc., usually consisting of steel chain or steel plates. (While historians generally credit the French for first employing metal armor on ships in the year 1835, an earlier utilization is recorded by the Koreans who claim that their Admiral Yi Sun-sin used a metal clad "Turtle ship" to rout the Japanese navy in the year 1593.) The first French naval armor was made from wrought iron. The Koreans, it is believed, used a form of brass.



armor-piercing

Armor-piercing a projectile designed to pass through armor.

Armour-piercing bullet a bullet designed to pierce armor. Use of a hardened steel core is favored for small arms ammunition while in larger calibers a heat-treated high carbon alloy steel is used with a very

hard head for penetration of the armor and a tough body to withstand the strains imposed by the twisting action of the projectile at angles of impact oblique to normal. To improve penetration in face-hardened armor plate, an armor-piercing cap is attached to the head of the projectile together with a windshield of steel or aluminum.

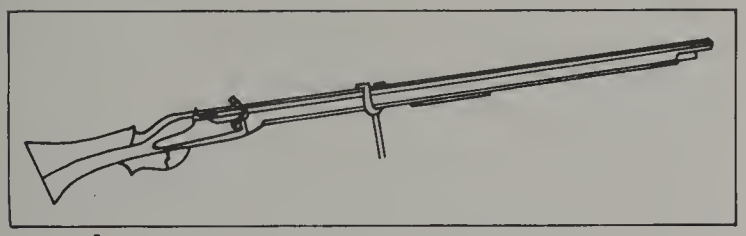
Armorer, armourer one who repairs and services small arms, more popularly called a gunsmith. The term originally applied only to the artisan who made and repaired suits of armor and similar metal accouterments.

Armory a place or building where arms are stored or where drills and reviews are held. Sometimes also used in referring to place of manufacture of firearms, such as Springfield Armory.

Arms chest a box or case used as a portable locker for holding or transporting small arms.

Arms locker a chest or cabinet in which small arms are stored or displayed.

Arms rack also termed gun rack. Shelving or other means to store small arms or to display them.



arquebus

Arquebus (ARE kwee bus) an early military musket also called harquebus. The word is derived from the French who in turn adopted it from the Dutch or German word meaning a gun with a hook. Originally the word was applied to a heavy matchlock gun supported on a hooked staff or forked rest. Later it was also used in referring to a wheellock gun.

Arquebusier (ARE kwee bus EAR) in early times a soldier armed with an arquebus.

Arsenal 1. a manufacturing or storage facility for arms and ammunition. Best known in the United States for their development work are Frankford Arsenal, Picatinny Arsenal and Watertown Arsenal. 2. a term often applied to the collection of weapons owned by an individual or a group.

Arsenic a hardening agent when mixed with lead. Used during the early days of making dropped shot. To be avoided when making projectiles for black powder arms.

Artificer (are TIF i sir) one who makes or contrives; a term formerly in common use to describe one who worked in an arsenal on shells, fuses, etc.

Artillery 1. in the military sense, guns of larger caliber than machine guns. 2. equipment, supplies, ammunition and personnel involved in the use of such guns. 3. science of using guns larger in caliber than machine guns.

Artisan (ART i san) a person trained in mechanical art or trade. A gunsmith is an artisan.

ASA abbreviation for American Standards Association.

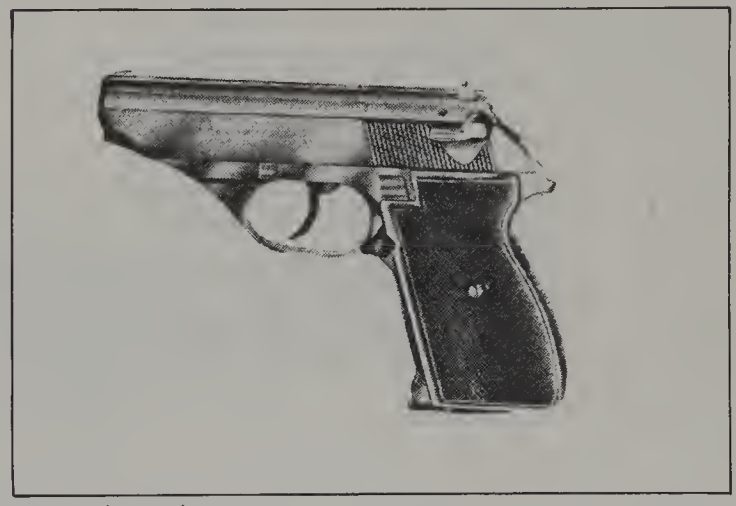
Ascending branch part of the curved path of a projectile extending from the muzzle of the gun to the highest point in its trajectory. From the highest point to the point of impact, it is called the descending branch.

A.S.M.E. abbreviation for American Society of Mechanical Engineers.

Assault gun any of various sizes and types of guns that are self-propelled or mounted on tanks and are used for direct fire from close range against a target that requires accurate placement of gun fire. This term may also be used to refer to certain automatic type rifles having military applications, such as the U.S. Army's M-16.

Assembly a group of parts put together to form a single unit, such as a "bolt assembly," "primer assembly," etc.

ASTM, A.S.T.M. abbreviation for American Society for Testing Materials.



astra (3000)

Astra the name under which pistols and revolvers are manufactured by Unceta & Company of Guernica, Spain.

ATA abbreviation for Amateur Trapshooting Association.

Atmospheric pressure the pressure at any given place in the air surrounding the earth caused by the weight of the vertical column of air immediately

above it. At sea level it is taken to be 14.7 pounds per square inch, the same pressure that will support a vertical column of mercury 29.92 inches high. Differences in atmospheric pressure have an insignificant effect on the accuracy of firearms but may have an appreciable effect on the shooter.

Attitude posture or position in preparation for some action or indicative of a state of mind or condition. Thus a loaded, cocked gun is said to be in firing attitude.

Auto a shortened expression for autoloader or automatic.

Autogenus fusing the technical name for welding. See "welding."

Automatic 1. in firearms, a term meaning a repetitive mechanical action; as applicable to "machine gun." An automatic firearm ejects the used shell, inserts a new one and continues to fire until pressure on the trigger is released. It is completely self-acting, unlike "semiautomatic" which means partially self-acting. In military circles, the term "automatic" is strictly employed in referring only to firearms that fire repeatedly with one squeeze of the trigger. Similarly, the term "semiautomatic" describes a weapon that is self-loading but which fires only one round with each squeeze of the trigger. The sporting world erroneously uses the term "automatic" in referring to semiautomatic weapons, primarily because there is no sporting application for a true automatic weapon. 2. a term also used, although improperly, to describe autoloading, i.e. semiautomatic, pistols.

Automatic ejector a term used in shotgunning, referring to a device that not only removes the shotshell from the chamber, but physically throws it, or them, clear of the gun. A selective automatic ejector ejects only empty casings while simply extracting unfired rounds. A non-selective ejector ejects both fired and unfired rounds.

Automatic feed mechanism a mechanism in an automatic gun that puts fresh cartridges into the chamber, ready for firing.

Automatic fire continuous fire from a fully automatic gun until pressure on the trigger is released. Semiautomatic fire requires a separate squeeze of the trigger for each shot fired.

Automatic firearm same as "automatic gun."

Automatic gun a firearm or cannon that fires continuously until pressure on the trigger is released. The term is synonymous with automatic firearms and automatic weapon.

Automatic machine gun See "machine gun."

Automatic pistol a pistol having a mechanism which utilizes the pressure of the exploding propellent powder to eject the used case, insert a new cartridge and prepare the pistol for the next shot. While actually a self-loading or semiautomatic weapon, the term "automatic" is generally, although improperly, used to describe such a pistol.

Automatic rifle a rifle having a mechanism which utilizes the pressure of the exploding propellent powder to eject the used case, insert a new cartridge and prepare the rifle for the next shot. Some models permit the shooter to elect either full automatic or semiautomatic fire.

automatic pistol

Auxiliary aiming point a point or object used for laying a gun on a target that cannot be seen. The gun is adjusted so that when the sight is aimed at the auxiliary aiming point the gun is laid on the target. A term employed in artillery firing.

Auxiliary cartridge or chamber an adapter that permits a small cartridge to be used in a larger chambered gun. Thus .22 caliber cartridges or pistol cartridges may be fired in rifles having chambers larger than the calibers of the cartridges. It generally consists of a hollow case of the rifle cartridge size having an open end into which the smaller caliber cartridge may be removably secured. A floating firing pin communicates the blow of the rifle's firing pin to the cartridge base.

Axis 1. a real or an imaginary line passing through an object and about which the object turns or seems to turn. 2. a centrally located imaginary line about which parts are, or a mass is, regularly located. Such central line in the bore of a gun is its axis.

Axis of sighting an imaginary line through the sights of a gun.

Axis of the bore the imaginary central line of the bore of a gun.

Azimuth (AZ i muth) the measure of an angle to express horizontal direction from north. Such horizontal angle is formed by a north and south line passing through the observer and a line from the observer to the observed point. The north-south line may be to true north, magnetic north or grid north. The angle may be expressed in degrees or mils and is measured clockwise from the designated north. It is employed in artillery firing.

Azimuth circle an instrument for measuring azimuths. It is a graduated circle and may be mounted on a sight, gun carriage, etc.

Azimuth deviation the angular difference between the line running from the gun to the target and the line running from the gun to the point where the projectile strikes.

Azimuth difference See "parallax."

Azimuth scale a graduated angle measuring device on instruments, gun carriages, etc., to indicate azimuth.

B

Babbitt, Isaac (1799-1862) of the United States, a goldsmith by trade who produced the first of the various alloys that bear his name. The first was an alloy of tin with a small percentage of copper and antimony.

Babbitt metal the name applied to a large variety of white metals used as linings for bearings. Named after Isaac Babbitt who, in 1839, obtained a patent for a type of bearing enclosing a soft metal alloy of copper, tin, and antimony. The compositions today may also contain small quantities of other elements.

Back action lock, back-work lock a percussion lock believed to have been introduced in the early 1830's, which had the mainspring mounted on the lock plate to the rear of the hammer instead of in front as in the conventional side lock. They were common by 1850 and particularly useful in pistols and double-barrelled shotguns.

Back blast rearward blast of gases from the breech of recoilless weapons upon discharge. Also sometimes called breech blast.

Backing targets used in precision competition when a number of rounds are to be fired at the same bull's-eye. Because a closely grouped sequence frequently results in one irregular hole in the match target, a moving backing target is required to verify the number of rounds fired. The backing target is generally placed some distance directly behind the match target and it is numbered to coincide with it.

Backlash 1. a rebound or recoil in loosely fitting parts. Also used in referring to the movement of a trigger beyond the point where the firing pin or hammer has been released or to the failure of a sight-adjusting screw to continuously move the sight as it is rotated. 2. lost motion in moving parts.

Back plate a plate at the rear of the breech mechanism of certain automatic guns.

Back position once a popular shooting position in which the shooter lies on his back with feet in the direction of the target, supporting the muzzle end of the rifle on his leg or feet and the butt in one of several ways.

Backsight the British term for a rear sight.

Backstop an artificial or natural bullet stop on a firing range, located behind the targets.

Backstrap that part of the frame of a pistol or revolver that forms the rear of the grip.

Back thrust the pressure exerted on the breechlock, bolt or standing breech by the head of the cartridge case when a firearm is discharged. The chamber pressure, in pounds per square inch, divided by the area of the cartridge head, in square inches, will give a result closely approximating the back thrust pressure.

Back-yardage common to the sport of trapshooting. Refers to those positions employed in handicap shooting from 24 to 27 yards.

Bacon, Roger circa 1214-1292 a famous early English experimenter with gun powder during the years 1230 to 1248 who, in 1248, wrote a historical manuscript describing the composition of gun powder but not claiming to be its inventor.

Baffle 1. a wall or screen to deflect or control the flow of a gas or liquid. Used extensively in gun muzzle brakes. 2. screens lining the walls of an indoor shooting range to deaden sound.

Baker a muzzleloading flintlock rifle introduced in England in 1802. It followed the smooth bore Brown Bess and was the British service rifle for almost 40 years. In the latter years many were converted to the percussion system.

Baker, Ezekiel (1758-1836) an English gunsmith, producer of the Baker military rifles, and inventor of improvements in locks and in the manufacture of bullets.

Balance 1. in shotgun design, the relationship between design and ballistics. 2. in firearms use, the mechanical balance or distribution of weight.

Ball the forerunner of the "bullet" and so named because the early firearms projectiles were spherical in shape. Today bullets are of various shapes but the term ball ammunition applies to a round of ammunition having a single solid conventional bullet of any shape. It does not apply when special purpose bullets, such as armor-piercing, incendiary or tracer, are used. In muzzleloading, it refers to the traditional round ball to differentiate that form of projectile from conical, minie or maxi bullets.

Ball, Albert (1835-1927) an American mechanical genius and versatile inventor having been granted some 135 patents. In the 1860's he invented a combination repeating and single loading rifle and a cartridge greasing machine that found wide use in both the United States and Europe.

Ball ammunition small arms cartridges containing solid bullets, other than special purpose bullets such as armor-piercing, incendiary or tracer.

Ballard a rifle produced from 1861 to about 1892 that arose out of a breechloading action invented by C.H. Ballard, an American, and patented by him in 1861.

Ball cartridge a colloquial term used in the military service applied to a round of small arms ammunition consisting of a cartridge case, a primer, powder, and a solid bullet other than a special purpose bullet such as armor-piercing, incendiary or tracer. The proper nomenclature is, for example: Cartridge, ball, caliber .30 M2. Cartridge, ball caliber .45 M1911.

Balled shot the clumping together of some pellets when fired instead of dispersing, a condition that sometimes occurred with soft shot, i.e., drop shot. See "drop shot."

Ballistic (ba LISS tick) having to do with the motion or flight of a projectile.

Ballistic coefficient a term used in the science of ballistics. It is a number that serves as an index to efficiency and indicates the ability of a projectile to overcome air resistance and maintain speed during flight. It is calculated from a formula wherein it equals the sectional density of a projectile divided by the coefficient of form. The larger the ballistic coefficient the more efficient the projectile.

Ballistic correction the adjustments made in firing data to allow for the effect of wind, temperature, etc., on the flight of a projectile.

Ballistic curve the path taken by a projectile in flight, also called the trajectory.

Ballistic density an assumed constant air density having the same total effect on a projectile in flight as the varying air densities actually encountered.

Ballistic efficiency the ability of a projectile to overcome the resistance of air. It depends mainly on the weight, diameter and shape of the projectile.

Ballistic pendulum a heavy free swinging bullet catcher (mounted like a pendulum bob) used to determine the velocity of a bullet at impact. The swing or distance the bullet moves the ballistic pendulum, the weight so moved, the weight of the bullet, and the time of swing are used in a formula to arrive at the velocity. The chronograph is a more accurate instrument for this purpose.

Ballistics the science or study of the motion of projectiles. Interior ballistics is the study of the motion of projectiles within the bore of a gun to ascertain the effect of the factors acting upon it, such as weight, size, shape, rifling, etc. Exterior ballistics is the study of the flight of projectiles after leaving the muzzle of a gun and the factors acting upon it such as the effect of air density, wind, velocity, etc. Forensic ballistics is the study of bullets and projectiles for legal purposes.

Ballistics formulae mathematical formulae relating to the motion of projectiles, some of which are set forth in the Appendix.

Ballistic table a table of figures for the various factors involved in the flight of a given projectile, such as range, angle of departure, time of flight, angle of fall, muzzle velocity, remaining velocity, height and location of summit of trajectory, and remaining energy. Ammunition manufacturers publish such tables for the products they make.

Ballistic wave the air wave or disturbance caused by the compression of the air ahead of a projectile in flight. Also called bow wave or shell wave.

Ballistic wind as in the case of ballistic density, it is an assumed constant wind that would have the same total effect on a projectile in flight as the varying winds actually encountered.

Ballistite (BAL i STITE) a former trademark applied to smokeless powder of the type made of nitrocellulose dissolved in nitroglycerin. First made in 1888 and used in small arms and mortar ammunition. Credited to Alfred B. Nobel, the famous Swedish chemist and engineer.

Ball-Powder first manufactured by Western Cartridge Company in 1933. It is produced by a process in which nitrocellulose is dissolved and, under specified conditions, agitated to form small balls — from which it takes its name. It is noted for its minimum erosive effect on gun barrels.

ball screw

Ball screw a screw secured at the end of a ramrod to permit a lead ball to be removed from a muzzleloading gun.

Ball starter See "bullet starter" and "false muzzle."

Ball & Williams the name associated with a single shot rifle, firing a rim cartridge made by the company of that name, used in the Civil War.

Band of fire a military term for fire from one or more automatic guns that gives a cone of dispersion so dense as to make it impossible for a man to penetrate the area covered without being hit.

Bandoleer, bandolier a cloth belt divided into pockets to hold cartridges or clips of cartridges for small arms. It is usually carried over the shoulder and across the chest by a shoulder strap. See "cartridge belt."

Bands the strips of metal that encircle the barrel and stock of a gun to hold them together.

Bannerman a name made well known through the catalog of Francis Bannerman & Sons, formerly lo-

cated in New York City, dealers in all kinds of military surplus material that included artillery pieces as well as small arms, warehoused in the replica of a 16th century Scottish castle, located on an island in the Hudson River about 70 miles north of New York City. The 6 acre island was acquired by the State of New York for park purposes on June 30, 1968.

BAR (B.A.R.) abbreviation for Browning automatic rifle.

Bar in a top break firearm it is that portion of the frame that projects forward beneath the barrel and into which the rear portion of the barrel normally rests. The barrel is hinged at the forward end of the bar.

Bar action side lock a form of side lock illustrated in the Appendix with "side lock"; also called a front action lock. The names arose from the fact that the mainspring projects from the forward edge of the plate and, therefore, is let into the side of the action bar that extends beyond the face of the breech.

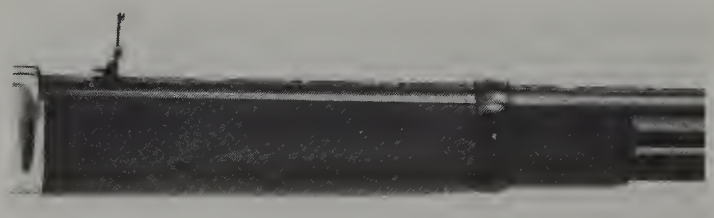
Barleycorn sight a triangularly shaped front sight, generally used with a V-shaped rear, that was popular towards the end of the 19th century. Often used on military rifles, a few foreign-made examples are still in use today.

Bar pistol an antique oddity formed with two or more chambers in a rectangular solid metal bar, so designed to lie flat in the hand or in a pocket and thus be hidden from sight. Sometimes called a book pistol because of its flat shape. Produced mainly in the period 1900-1910.

Barrage (bah RAZH) concentrated artillery or machine gun fire.

Barrel the hollow cylinder or tube of a gun from which a projectile is fired. In built up guns the inner part of the barrel is called the tube. See "smoothbore" and "rifling." The hollow portion is called the bore, the end of the bore into which the cartridge is seated, the breech, and the end from which the projectile emerges is called the muzzle.

Barrel assembly the barrel of a gun with the parts necessary to attach it to the rest of the gun. A rifle barrel is usually threaded to the receiver or action of the gun. See "barrel shank."



barrel band

Barrel band a strip of metal designed to link the barrel with the forend or magazine tube of a firearm. Many military rifles are equipped with barrel bands, as is the Winchester Model 94 carbine.

Barrel blank a forged steel rod used for barrel making. Though generally rough drilled from end-to-end, barrel suppliers offer blanks in all degrees of finish, including rifled or, rifled and chambered, or, rifled, chambered and threaded and, at times, contoured.

Barrel channel the U-shaped channel carved in a wooden forend or forearm to accept and embrace the barrel of a firearm.

Barrel diameter refers to the outside diameter of a barrel.

Barrel erosion the wear of the bore, i.e., the interior of the barrel, caused by the chemical action of the powder gases and the friction between the projectiles and the wall of the barrel. The effect of erosion is to cause a loss of muzzle velocity.

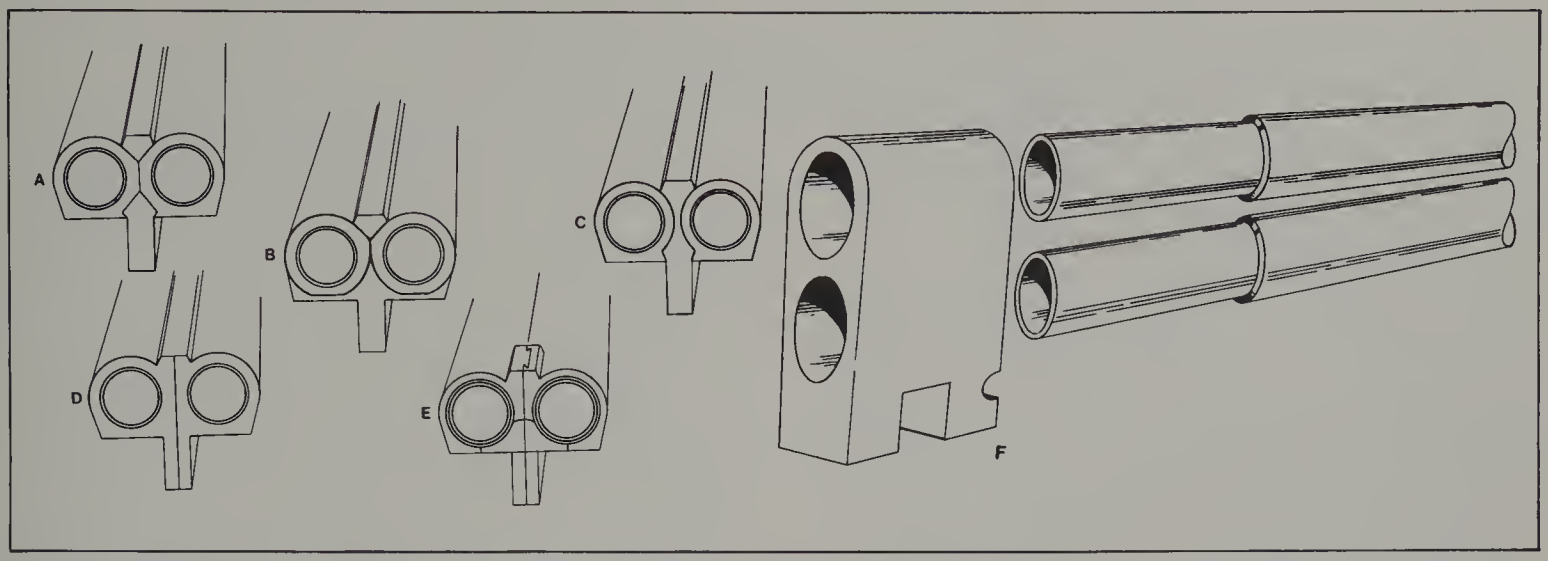
Barrel extension a metal projection fixed at the rear of the barrel of certain automatic guns. It extends rearward and holds the breech locked against the gas pressure in the chamber when the gun is fired.

Barrel joining the various methods employed by gun makers for joining the barrels of side-by-side double guns, over & under models or the rifle-shotgun combinations commonly called "Drilling guns." Here we illustrate the six most commonly used techniques: In diagrams A, B, and C, the lugs and rails are separate components that are brazed to the breech ends of the barrels. In diagrams D and E, the lugs are forged as part of the barrels and/or dovetail joined. Diagram F shows a form of monobloc as it is used for an over & under gun: A heavy steel block is forged, milled and drilled to encompass the chamber ends of both barrels; lugs are then cut into the heavy lower surface. Upper and lower ribs are then soldered into position and the barrels fitted to the action. At one time gun makers soft (tin) soldered these components (a technique that necessitates cold blueing) but most gun makers now use only silver solder and the result can be tank (or "hot") blued.

Barrel key a tapered crossbar designed to lock the forestock of a muzzleloading firearm to the barrel by means of a keyway fixed to the underside of the barrel. Sometimes made of brass or otherwise decorated.

Barrelled action the receiver mechanism of a firearm fitted with a barrel.

Barrel length the distance between the muzzle and the rear face (breech) of the barrel where it abuts the breech bolt or block, thus including the chamber. Revolver barrel lengths do not include the chamber, chambers being in the cylinder. In calculating the length of a barrel the designer takes into considera-



barrel joining

tion the burning rate of the intended propellent powder and the characteristics of the projectile. Generally, the longer the barrel, the faster will be the projectile it fires, to a point.

Barrelling rasp a cylindrical file-like device having teeth set for various degrees of coarseness from rough to fine so that simple rotation of the head will offer the desired cut. Used to rough cut the barrel channel in bedding a barrelled action to a wooden stock.

Barrel lug a lug or bolt securely fastened to the underside of a barrel for the purpose of acting as a recoil shoulder, or for stock-mounting purposes, or for serving as an anchoring point for a bayonet.

Barrel manufacture since the 15th century and prior to the latter part of the 19th century, when the art of deep hole drilling of metals was developed, barrels for hand carried firearms were made from tubes formed around a mandrel. Strips of iron rods or wires were twisted about the mandrel and forge welded together. Subsequently the resulting tube was reamed and finished. In this manner Damascus barrels were made. Later strips of iron were wrapped around a mandrel or otherwise fashioned about it and forge welded to form a tube. Until the appearance of smokeless powder, soft iron made a satisfactory barrel for use with low heat and pressures of black powder and soft lead bullets.

Barrel movement when a gun is discharged it is effected by a number of factors. Evident to the shooter is the backward movement known as recoil, or kick, and the upward movement of the muzzle known as recoil climb or muzzle jump. These movements are the cumulative result of factors acting before and after the bullet leaves the barrel. While the bullet is in the barrel, three influences are working on the barrel, namely, initial recoil, vibration and jump. Jump, depending on the barrel length, weight, shape and forestock fit, may result in the muzzle end of the barrel being dipped below the axis of the bore at the instant the bullet leaves it. See "barrel whip."

Barrel obstructions foreign materials that occupy the bore of a gun barrel. Such obstructions cause powder gas pressure to build up and if beyond the safe limit for the gun will rupture the barrel or cause a ring bulge.

Barrel reflector an instrument for examining the bore and chamber of a gun. It consists generally of a mirror mounted on a frame and a tube that may be inserted in the chamber to give a view of the bore. Placing a piece of white paper or cardboard at the breech, holding the gun to obtain light on the paper and sighting through the muzzle end of the bore, produces a similar but less efficient effect.

Barrel shank that portion of a barrel that is threaded and encircled by the receiver. Generally contains the cartridge feeding cone and the cartridge head portions of the chamber.

Barrel step that portion of a barrel where taper starts immediately in front of the chamber area.

Barrel tenon 1. the threaded portion of a barrel designed to screw into the receiver. 2. a form of barrel-anchoring cross-pin common to muzzleloading arms, designed to lock the forestock to the barrel by passing through the stock, through a hole in a lug fastened to the barrel, and through the stock of the opposite side.

Barrel throat See "throat."

Barrel time the time it takes a bullet to travel the length of a barrel, from the time it starts from its seat until the instant it leaves the muzzle. Tests with modern ammunition and weapons indicates that barrel time usually varies from .00077 to .00107 of a second.

Barrel vents 1. vent holes drilled in the receiver in

close proximity to the chamber of the barrel. As an added safety measure, these are designed to release gases when excess pressures flow back into the breech mechanism. Common to military rifles. 2. Ports cut into a barrel near the muzzle to siphon off gases before the bullet clears the barrel. These are designed to reduce recoil and muzzle jump but frequently create uncomfortable muzzle blasts.

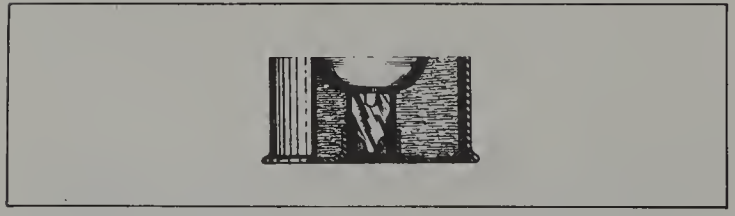
Barrel vibration barrel motion as the result of firing the gun, a vibratory motion shared by the other parts of the gun.

Barrel whip, barrel flexing the downward flexing of a barrel below its longitudinal axis, occurring after the gun has been fired. With some long barrels flexing action may start before the bullet clears the muzzle. Barrel whip is caused by the combination of recoil (rearward pressure) and the fact that the axis of the bore lies above the center of gravity of the gun, as well as above the points of restraint imposed by the shooter. When fired, the barrel movement originates at the breech end, the muzzle tends to whip downward and this action is naturally followed by an upward counter-action. The extent and duration of this action depends not only upon the characteristics of the gun and cartridge but, most especially, upon the length, weight and shape of the barrel, barrel time, and, in the case of long guns — the forestock. It is minimal in handguns. To minimize this effect, competitive rifle shooters use heavyweight barrels with little or no taper.

Bar sight the rear sight of a firearm consisting of a moveable bar generally provided with an open notch.

Base 1. referring to the basic wad of a shotgun shell, it is its base filler of solid-paper or other material to fill up the space in the shell not occupied by the propellent powder. 2. that portion of a rifle or pistol cartridge which contains the primer. More frequently called the case "head."

Base of trajectory an imaginary straight horizontal line drawn from the center of the muzzle of a gun to the point, level with the muzzle, and in the downward path of the fired projectile.



base wad

Base wad compressed paper or other material inside a shotgun shell at its base, sometimes referred to as "base", to fill up the space in the shell not occupied by the propellent powder.

Basket weave checkering a form of grip decoration that resembles a basket weave and which serves to provide a good gripping surface. Especially popular among makers using the impressed checkering method, basket weave patterns may also be hand cut.

Batterie also called frizzen, an upright metal striking plate on the snaphaunce or flintlock upon which the pyrites or flint falls, striking sparks to ignite the priming powder. In the snaphaunce it was not part of the pan cover; in the flintlock it was combined with the pan cover causing it to raise as the batterie was struck.

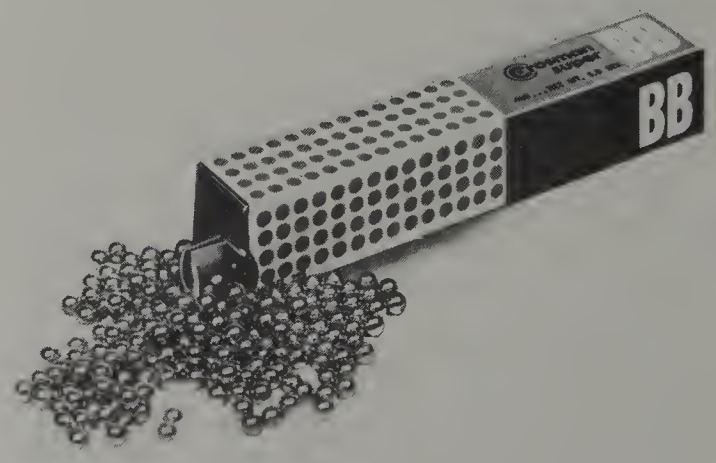
Battery 1. another spelling for batterie. 2. two or more artillery pieces used in combination. 3. the name of an artillery unit. 4. an artillery piece in firing position is said to be in "battery."

Battery cup the receptacle in the head of the case of a center fire cartridge or in the base of a shotgun shell which is adapted to hold the cup or primer.

Battle-ax pistol an oddity. It is the combination of a pistol and a battle-ax, the butt of the pistol being also the handle of the battle-ax. The pistol was either of the wheellock or flintlock type.

Battle sight a rifle rear sight with a large opening or notch set for a convenient range for emergency military use at close range, when there is no time for accurate adjustment. Such setting for U.S. Springfield, caliber 30-06, M 1903 rifle is 530 yards. Current doctrine of the U.S. Army prescribes a "battlesight zero" for 250 meters, i.e., the sights of a weapon should be so adjusted that the trajectory of the bullet and the line of sight intersect at a range of 250 meters (273 yards).

Battue (bah TOO) a hunting term referring to the beating of woods and the like, to drive out game, or, to the capturing of such game.



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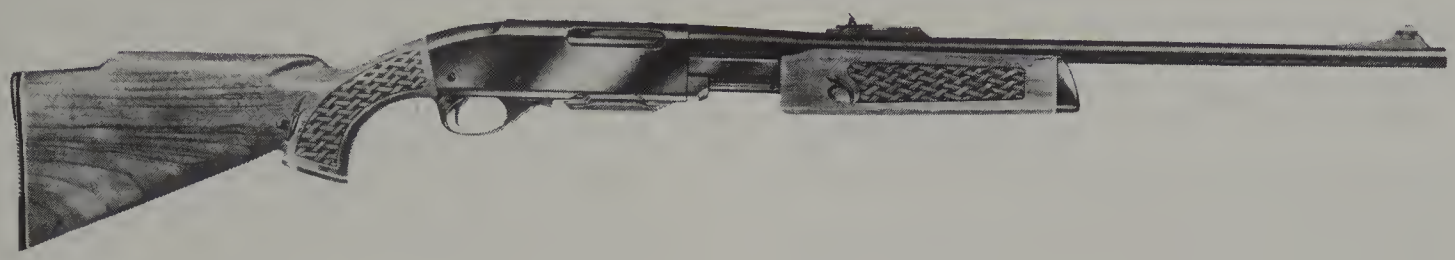


basket weave checkering

Bayonet a blade attachable to the muzzle end of a rifle for use in military hand combat.

Bayonet lug a projection on a military weapon adapted to engage a slot on a bayonet and thus hold the bayonet as a rigid extension of the weapon.

BB this is a term that evolved over the years to describe two distinctly different items and, for that reason, often proves troublesome: 1. when referring to a popular size of air rifle or air rifle shot, the term BB relates to a round steel ball which has been lightly coated with copper and which measures .175 of an inch, average diameter. BB caliber air and gas guns have bores that measure between .176 and .177 of an inch in diameter. 2. the term "BB shot" pertains to the lead shot commonly used in shotgun shells. This is usually a dropped shot that measures approximately .181 of an inch in diameter. Obviously, because of the difference in sizes, lead shot of BB size cannot be used in BB caliber air or gas guns.

BB cap abbreviation for bulleted-breech cap. Essentially a primer or cap, to which a bullet has been added, without a propellent charge other than the fulminate mixture in the cap.

Bead the name given the small knob that is mounted at the muzzle end of a firearm to serve as a front sight.

Bead sight the small knob or "bead" used as the front sight of a firearm.

Beaufort scale (Bo fort) an internationally used number scale of wind velocities, ranging from 0 for "calm" to 12 for "hurricane."

Beavertail forend a forend of generous width that permits a shooter to hold the weapon without having his fingers touch the barrel.

Bedding 1. refers to making close contact between the barrel and the forearm of a firearm by means of bands or screws or other holding means. 2. seating a rifle barrel in a wooden stock in such a way that the wood bears firmly against the barrel at its furthest extremity in order to dampen barrel whip and improve accuracy. See "Acraglas" "bedding control."

Bedding control a device installed in the forend of a rifle stock, about an inch or two from the foremost edge, designed to provide mechanical pressure to the underside of the barrel. In this way it is believed to control barrel whip. Commonly found in target rifles. Often designed with two or more spring loaded plungers that are adjusted by means of screw-like devices set into the wooden forestock and furnished with a battery and light auxiliary unit which indicates when contact is made with the barrel by the plungers.

Bedding screws are adjustable screws in the forend of a stock that apply upward pressure against the underside of the barrel to dampen vibration in an attempt to improve accuracy.

Beech (Genus Fagus) a hardwood timber tree whose wood is often used as a substitute for walnut in gun-making, particularly in military firearms. Though strong and durable, beech does not have appealing grain figurations and for that reason is rarely used by sporting arms makers, and then may be found only in inexpensive models.

Bell the outward flare at the muzzle end of a gun barrel, common in antique guns, so named by reason of its bell shape.

Bell crank a bent lever having two arms at an angle to each other and pivoted at the point where the two

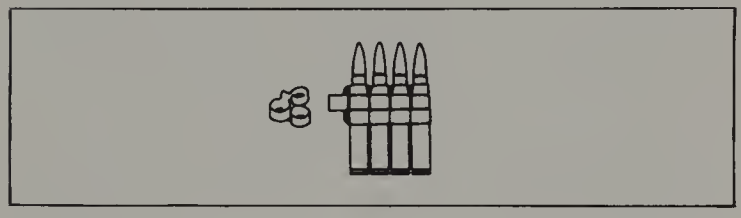
bead sight

arms join. Frequently, the two arms are at right angles to each other.

Belly gun a colloquial expression for a weapon concealable in a trousers waistband or one carried in, or on, the belt of the wearer.

Belt the narrow band that encircles some cartridge cases just ahead of the extractor groove and serves to stop the case in the chamber, thus controlling headspace for the type of cartridge.

Belted case a cartridge case having an enlargement in the form of a band or belt just ahead of its extractor groove, to position or seat the cartridge in the chamber of the firearm. Generally employed only on unusually large capacity rifle cartridges of the magnum type.



belt fed

Belt fed an automatic weapon adapted to be supplied with cartridges from a feed belt.

Belt gun a gun worn in a belt holster.

Bench lathe a machine that may be mounted on a bench and which is equipped to hold and rotate a piece of material being shaped. It is very versatile and finds wide use by gunsmiths for making small precision parts, being adapted not only for turning and boring but, with attachments, for milling, grinding, chasing, cutting and a number of other operations.

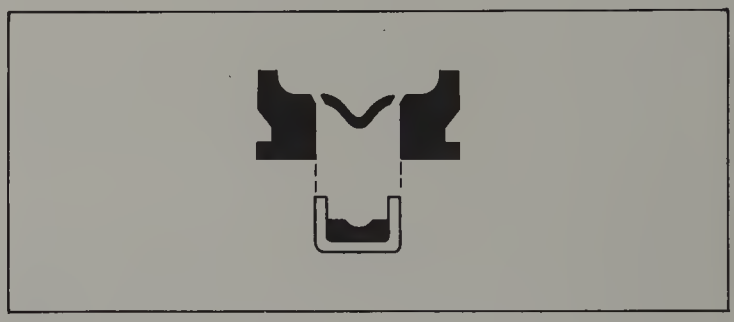
Bench rest a firm, heavy table upon which a shooter may rest his elbows and steady his body while he is seated on a chair or stool. A forearm rest for the gun is provided on the top of the table. A bench rest is used for "sighting in" a firearm as well as for accuracy testing. Bench rest target shooting has become a popular sport in recent years.

Bend of the stock See "drop."

Bennett, Epentus A. an American inventor who, in 1838, with Frederick Haviland, patented a breech loading percussion rifle. Twelve individual blocks, secured together, rotated parallel with the axis of the bore instead of transversely to it.

Bent a notch in which the sear or trigger is held under the pressure of the mainspring until disengaged by movement of the trigger. Such notch is usually in the hammer of the gun.

Berdan, Hiram (–1893) inventor of the Berdan primer and a mechanical engineer who on November 30, 1861, became Colonel of the 1st U.S. Sharpshooters, a regiment that played an important part in a number of Civil War engagements including Chancellorsville, and Gettysburg. For gallantry in those two battles, he was promoted to General. He resigned his active commission January 2, 1864, and engaged in the designing of firearms, being granted a number of patents in the years 1865 to 1870.



berdan primer

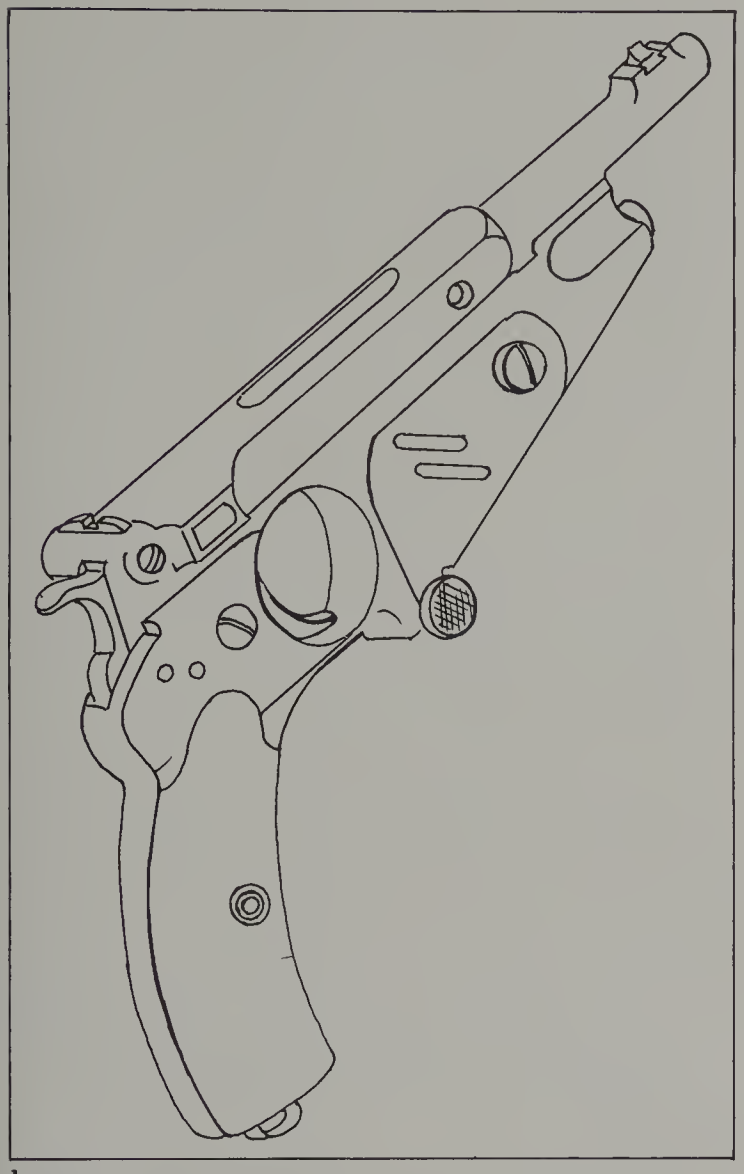
Berdan primer a primer developed by Colonel, later General, Berdan in the late 1860's, used in the United States for about 20 years until supplanted by the Boxer primer. The Berdan primer is still used extensively in Europe. It differs from the Boxer primer in that a boss in the cartridge case head serves as an anvil in the primer pocket whereas the Boxer primer contains its own anvil.

beretta (1934)

Beretta the name for certain automatic pistols of Italian manufacture. The 9mm seven shot, semiautomatic pistol was an official weapon of the Italian military from 1934 to about 1955.

Bergmann, Theodore a German inventor who in 1893 patented the first of a series of unique automatic pistols that became well known in Europe.

Bernardelli the name for automatic pistols and dou-



bergmann

ble barrel shotguns made by the Italian manufacturer of that name.

Berthier (BER thih er) a bolt-action, magazine fed French military rifle used from 1890 through World War II, although officially replaced in 1936. Being a combination of the Gras action in modified form and the Mannlicher magazine, it is also known as a Mannlicher-Berthier.

Bessemer, Sir Henry (1813–1898) British engineer and inventor in 1855 of the process for making steel that is known by his name.

Biathlon a Greek term meaning "dual test", today referring to an Olympic competition which combines cross-country skiing with rifle shooting. At present, the biathlon course covers 20 kilometers (12.5 miles) with four stops during each of which the contestant fires five shots from a smallbore (.22 caliber) modified target rifle at mechanical targets (20-shot total). While primarily a race against time, emphasis is placed on shooting accuracy by means of penalties that add 150 additional meters to the prescribed course for each shooting miss. The 1984 Olympic calendar also scheduled two other versions of this competition; a 10 kilometer sprint and a 30 kilometer relay for four-man teams. (See modern pentathlon.)

Bicycle rifle in reality, generally a single-shot pistol with a detachable skeleton stock of wood or metal, common during the latter part of the 19th century when bicycling enjoyed widespread popularity.

Big bore cartridge a term used in the United States that, in the strictest sense, refers only to cartridges of .30 caliber or larger. In recent years, with the advent of high velocity cartridges in the .270 and 7MM classes, the term is often erroneously used to include these shells under .30 caliber. In England the term big bore refers only to cartridges larger than .450 which are used in hunting large African and Asian game.

Binoculars optical glasses designed to be used simultaneously with both eyes. Binocular field glasses consist of two optically parallel telescopes. It is the practice of binocular manufacturers to indicate optical characteristics of instruments by simple number combinations. The first number of a given combination designates magnification and the second denotes aperture size in millimeters. Consequently the designation 6 × 30 is applied to a binocular with a magnification of 6 and an aperture (objective lens) of 30 millimeters in diameter. By dividing magnification into aperture size, one can determine the size of the exit pupil, i.e., $30 \div 6 = 5$, therefore the exit pupil of a 6×30 binocular is 5 millimeters. By the same token, when the sizes of the exit pupil and aperture are known, magnification can be determined by dividing the exit pupil dimension into the aperture size: $30 \div 5 = 6$.

Bipod a two legged support for a firearm to carry part of its weight and to permit greater accuracy of fire.

bipod (for spotting scope)

Birch (Genus Befula) a tree whose wood is only occasionally used for gunstock work. Though densely grained and ideally suited to gunstocking, it is very plainly grained and resists attempts to beautify it through elaborate staining.

Bird shot a general term referring to small sizes of lead shot, such as that employed in loading shotgun shells. The term "bird shot" may be used to indicate most any given size (from two to nine) and does not relate specifically to one given size. Larger shot sizes are more appropriately called "buckshot" and smaller sizes, "dust shot."

Bites the slots cut into the lugs of a double barrel shotgun which are engaged by the locking bolts when the barrels are secured in a firing attitude. Also called "grips."

Biting angle the smallest angle of impact at which a projectile will penetrate or pierce armor.

Black powder also known as gunpowder, the forerunner of modern powders. Made of a mechanical mixture of about 75 parts of powdered potassium nitrate or sodium nitrate, 15 parts of charcoal and 10 parts of sulphur. Reputed to have been first made by the Chinese in the 13th century. It is a low order explosive used in igniters, primers, fuzes and blank fire charges. Now almost obsolete.

Blade a thin upstanding part used in some firearms as a front sight called a post sight.

Blade sight a flat upstanding metal piece integral with or adjustably mounted at the muzzle end of a gun to serve as a front sight.

Blanchard, Thomas (1788–1864) the American inventor of the lathe that is named after him. It was the first of its kind, built in 1822 and designed to turn wooden parts of irregular shapes, such as gun stocks. An exact model of the desired finished product is mounted on one side of a frame and serves as a pattern for the wood blank mounted on the opposite side. Transmission of the outline of the rotating model to a cutter applied to the wood blank rotating at the same speed faithfully reproduces the shape of the model.

Blank a cartridge or shell lacking a bullet or projectile, intended to produce a noise when fired in a gun. The explosive charge, generally E. C. smokeless powder, is retained in the case by a wad held in place by crimping the open end of the case. Upon firing, such wad may cause injury to persons immediately in front of the gun.

Blank ammunition ammunition containing powder but no projectile; used in training, signaling and firing salutes. Fast burning powder is used in autoloading gun to compensate for lack of bullet resistance. Blank ammunition cannot be indiscriminately interchanged since what is suitable for one use may not have the proper burning rate for other uses.

Blank fire powder orange or pink explosive powder resembling coarse sand, used as a charge in small arms, blank cartridges, and as a bursting charge in hand grenades. Also called E.C. blankfire or E.C. smokeless powder.

Blank firing attachment generally, an adapter, specifically an attachment mainly employed with autoloading military weapons for training purposes or for simulating combat scenes in the entertainment industry. It serves the purpose of building up pressure or recoil that is normally provided by the resistance of a bullet in being accelerated from a static position to its muzzle velocity. It substitutes for the bullet in blowback and gas operated weapons by restricting the bore; in recoil operated weapons by a restriction on the barrel jacket to build up pressure between the muzzle and the breech face. A cartridge stop is employed with certain belt fed weapons to permit feeding of the shorter blank rounds and to prevent the use of live ammunition. See "cartridge stop."

Blank powder a powder for use in blank cartridges, which in composition is almost a guncotton and is extremely fast burning. It is dangerous for that reason to load a bullet in front of it since detonation will occur, bursting the gun.

Blast an explosion or violent detonation or violent gust of gases or of wind. See "muzzle blast."

Blind a camouflaged hunter's shooting stand. Most often employed by migratory bird hunters, in or near waterways. May also be used to refer to places of concealment when hunting dangerous and/or predatory animals.

Blind box magazine an enclosed magazine let into the stock, resembling a mortise in the wood, usually lined on its sides and ends with sheet metal leaving the floor of wood uncovered.

Blind hole a hole extending only part way through a part.

Block that portion of a firearm that serves to lock the cartridge in the chamber and which absorbs the primary recoil thrust. Often called the breechblock, breech bolt or, simply, bolt.

Blowback 1. the rearward movement, under pressure, of the gases formed when a projectile is discharged from a gun. This normal rearward pressure is utilized in some types of automatic weapons to cause the breech mechanism to extract and eject the spent case and reload a fresh round in preparation for the next shot. 2. Abnormal blowback is caused by a faulty primer or a broken cartridge case.

Blowback action an automatic or semiautomatic action that utilizes the expanding gases of the propellent powder to drive the breech block action backward. Normally the breechblock holds the breech closed under the force of the recoil spring, no mechan-

ical locking system being employed. The inertia of the movable parts is such that a bullet leaves the muzzle before the breechblock moves backward.

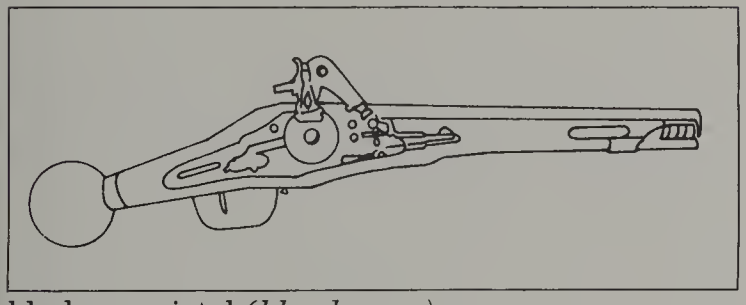
Blow forward action an automatic or semiautomatic action utilizing the expanding gases of the propellent powder to move the barrel forward, away from a standing breech, to open the action and eject the fired case. A spring restores the barrel to firing position and in so doing reloads and cocks the gun. The .32 caliber Austrian Scharzlose (1908), sold in the period 1908–1915 and no longer manufactured, is reputed to have been the only pistol with such action to have been commercially marketed.

Blowgun a tube from which a dart or other projectile may be discharged by the force of the breath.

Blowhole a defect in a metal ingot or casting caused by a gas bubble entrapped in the course of manufacture.

Blown pattern a shotgun pattern of erratic distribution usually caused by the escape of gas past the wads into the shot column or by excessive constriction at the choke.

Blown primer a cartridge defect that causes the primer to be dislodged from its seat in the pocket of the case when the cartridge is fired.



bludgeon pistol *(bloodge-un)*

Bludgeon pistol (BLOODGE-un) an antique oddity designed for use both as a firearm and a club, found in some wheellock, flintlock and percussion pistols. The barrel serves as a handle for the butt-club.

Blueing, bluing the process of creating a gun-blue finish on steel through the application of an acid solution that artificially induces rust. By means of controlled rusting and brushing, the surface of the steel acquires a blue to blueblack finish that minimizes light reflection and secondary rust formations. See "cold blue", "hot blue" and "browning."

Blueing tanks the tanks used by manufacturers and gunsmiths to contain the water and chemical solutions used in the blueing of gun metals.

Blue pill a nickname given to a high pressure test cartridge used for proof firing of small arms.

Bluer any chemical solution designed to induce a blued finish on metal.

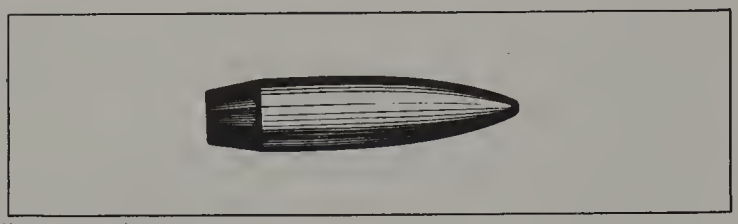
Blue rock, rock the clay target used for skeet or trap shooting. A term carried over from pigeon shooting in which the European blue rock variety of pigeon was often used.

Blue vitriol (VI tree all) a commercial name for copper sulphate. Other common names are "blue stone" and "blue copperas."

Blue whistlers, whistlers a local term used in some parts for large size buckshot, in that same locality small size buckshot is called "low mold."

Blunderbus an antique smoothbore flintlock or wheellock gun with a round or oval barrel and a bell shaped muzzle, generally of large bore intended to discharge a number of missiles at close range. In use in the 17th to the first part of the 19th century.

blunderbus



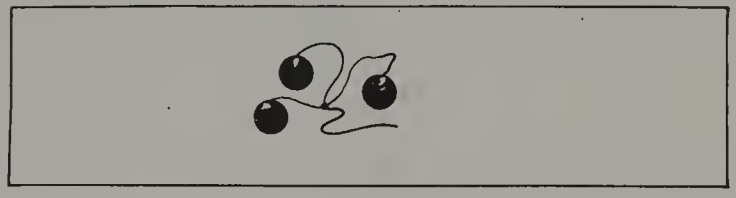
boat-tail

Boat-tail a term meant to define the shape of a bullet. The rear end of a projectile that is tapered or cone shaped instead of cylindrical. Those having a cylindrically shaped base are termed "flat base" or "square base."

Bobbing target a target that is exposed at short intervals for timed practice fire. The target is turned to show only its edge to the shooter between the times it is exposed for fire, or it may be set up so it can be pulled down out of sight of the shooter. Also occasionally called a swiveling target.

Body the British term for receiver.

Boehler steel a premium quality gun making steel that is stainless and acid-proof. Manufactured by GEBR. Boehler & Company A.G. Dusseldorf, Germany.



bola

Bofors a 40mm anti-aircraft gun known by the name of its manufacturer, Bofors Company of Sweden.

Boiled linseed oil a filtered form of linseed oil that is mixed with assorted driers for the purpose of gunstock finishing. The term boiled is really a misnomer.

Bola a thong or cord having a round stone or ball attached at one end, adapted to be thrown for the purpose of entangling an animal. It is used by the South American Gaucho.

Bolster the ignition-transmitting drum that is fastened at right angles to the barrel of percussion firearms and which is made to accept the screw-in nipple.

Bolt the sliding part in a breechloader that pushes a cartridge into position and locks or holds the mechanism to prevent it from opening when the gun is fired. It is also referred to as the breechblock. It usually contains the firing pin and the extractor and takes the back pressure of the discharge. "Bolt mechanism" refers to the assembly that includes the moving parts that insert, fire and extract a round of ammunition. When a "bolt action" gun is referred to, it means that a handle projects from the mechanism by which the bolt may be pulled back and forth to eject the spent cartridge, insert a new one, and cock the gun.

Bolt action any firearm that is manually operated by a bolt mechanism. Generally refers to a rotating bolt device that lifts about ¼th of a turn and is pulled rearward to discharge a spent casing, and which is cocked for a second firing upon being returned to its forward-and-down locked position. Rare bolt action rifles were made with a straight-pull action (without rotation) — for example, the Steyr Model 95 military model.

bolt

bolt action

Bolt, altered a bolt that was primarily designed for military use (when the bolt protrudes straight out at a 90° angle from the vertical line of the pistol grip) and which has been altered, by forging or other means, so as to lie flat against the side of the stock. Most often a bolt is altered so that it will not be interfered with by a mounted scope.

Bolt bending jig a two piece jig mechanism that encloses the main body of a rifle bolt, exposing only the handle which is then heated until it can be bent by hammering.

Bolt face that portion of a firearm's bolt which engages the cartridge head and from which the firing pin protrudes when the gun is fired.

Bolt guides the parallel tracks in the side walls of a receiver that serves to guide the bolt back and forth in line with the chamber.

Bolt head the front of a bolt or that portion that engages the case head of a shell upon firing.

Bolt knob the round or pear-shaped end of a bolt handle that is gripped by the shooter when working the bolt.

Bolt lever the British term for a bolt handle.

Bolt lock the latch, lug or cam that mechanically locks the bolt to maintain the seal of the breech at the moment the gun is fired.

Bolt plug the British term for a bolt sleeve.

Bolt rails See "bolt guides."

Bolt sleeve (bolt plug) a component part of a number of bolt action rifles such as the Krag and Mauser which serves several purposes in its position at the rear of the bolt.

Bolt stop the projection in the gun in the path of the bolt to stop its rearward motion.

Bolt throw the distance that a bolt travels from the fully closed to the fully opened positions.

Bomb a container holding an explosive, or a chemical composition, or both, exploded by contact, time fuzes or a combination of both.

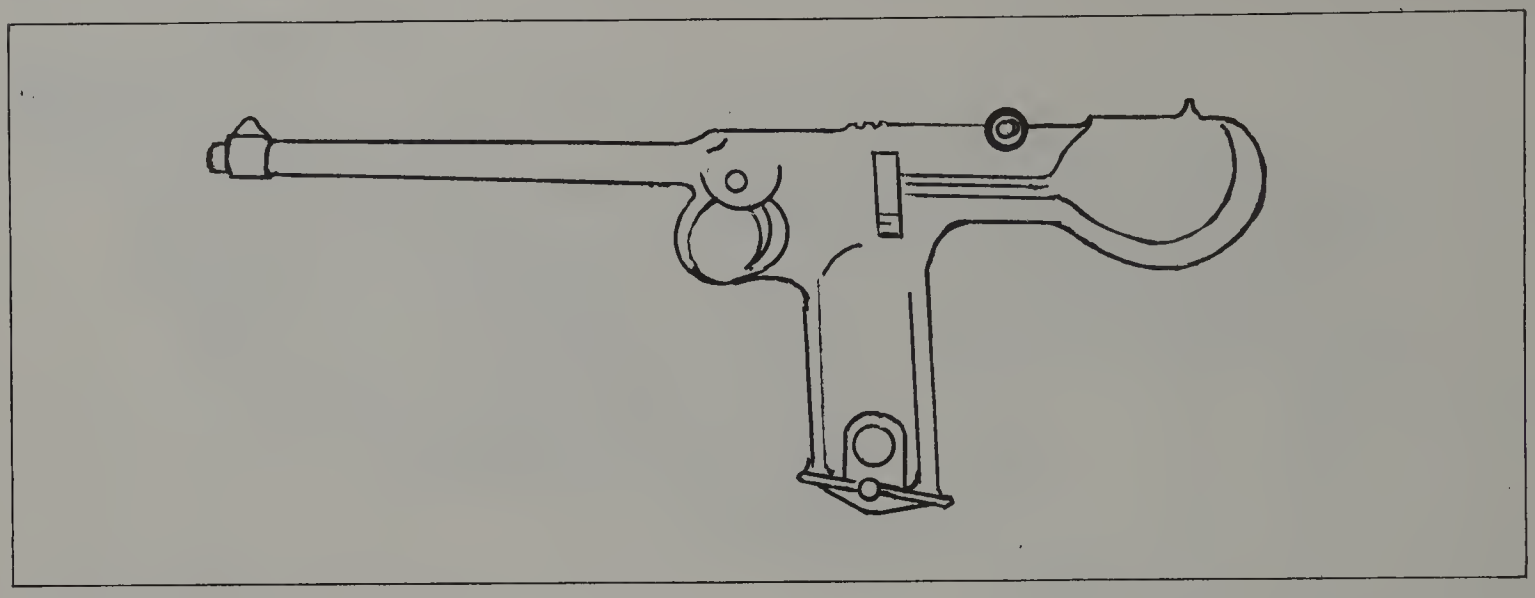
Bombard the name given the earliest type of cannon that hurled stones and other missiles. It also refers to attack by artillery fire such as to "bombard a fortified position", etc.

Bombarde one of the words used in 14th century literature as a name for cannon and hand arms.

Booster an explosive charge added between the primer and the main charge to accelerate the explosion of the main charge. Used in artillery firing.

Boot a leather sheath usually used on the side of a vehicle to carry and protect a firearm.

Bootleg pistol 1. an early type of pistol for dueling and target practice deriving its name from the fact



borchardt pistol

that it was made to carry inside a bootstrap. 2. another type of pistol, called a bootleg pistol, had its hammer under the barrel and was in vogue before 1850. Also sometimes called a saloon pistol or an under-hammer pistol.

Borchardt, Hugo (BOOR shard) an American gun maker and inventor who in 1890 developed one of the earliest successful autoloading pistols, but had to go to Germany to find a manufacturer to undertake its production in 1893. It used a toggle lock system. Georg Luger, an engineer with Ludwig Loewe, the Berlin manufacturer, made improvements which resulted in the production in 1900 of the pistol, later to be sold under the trademark Luger in the United States.

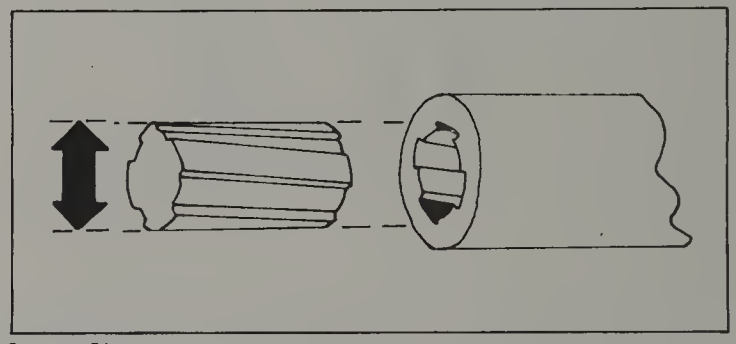
Bordering tool a tool used by gun stock checkerers with which to add a decorative edge or border to a checkered pattern.

Bore 1. to pierce with a hole. 2. the interior of the barrel of a gun. It is used to refer to the enclosed air space as well as to the inside surface of the barrel, including the surfaces of the rifling if it is a rifled barrel. It is also a term used to indicate caliber. It should not be confused with the gauge of a gun. See "gauge."

Bore brush a brush used to clean the bore of a gun. Brushes made of brass or plastic bristles are used to clean lead fouling and powder deposits from the bore of a firearm.

Bore chamber See "chamber."

Bore diameter in the case of rifled barrels, two diameters are involved. The diameter of the circle on whose circumference lie the surfaces of the grooves and the diameter of the circle on whose circumference lie the surfaces of the lands. It is the land diameter



bore diameter

that is used to measure the caliber of a rifled barrel. See "caliber."

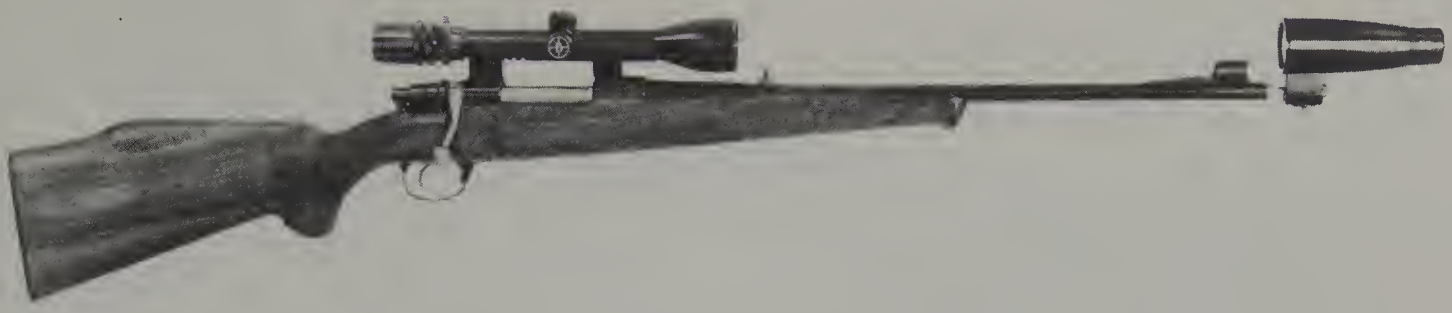
Bore freshening a method for restoring worn out rifle or pistol barrels by recutting the rifling, usually to a slightly larger caliber.

Bore leading (LED ing) lead deposited in the bore of a barrel by passage of lead bullets through it. To help prevent this, lead bullets are usually provided with circular grooves, called cannelures, that are filled with a bullet lubricant. That is, a heavy lubricating grease or wax.

Bore rest See "clinometer rest."

Bore safe a term applied to artillery fuzes that have an interruption in the explosive train that prevents a projectile from exploding until after it has left the gun. Sometimes the term "detonator safe" is used.

Bore sighter 1. a device used to visually align the axis of the bore of a gun with an aiming point. It has two parts, one to be attached to the muzzle of a gun, the other to its breech. By sighting through these parts, the axis of the gun sight and the axis of the bore may be brought in parallel to each other. 2. In small arms, a prismatic optical device that enables



bore sighter

one to view the length of the bore from a position at right angles to the chamber — designed to permit viewing from the breech to the muzzle on solid breech guns.

Bore sighter an optical device used for bore sighting purposes, often called a "collimator."

Bore sighting sighting through the bore of a gun with or without bore sights to align the axis of the bore with the sights of the gun.

Boring machines are of two general classes — vertical and horizontal. The one built by Smeaton in 1769 was succeeded by the first true boring machine built in 1775 by John Wilkinson, paving the way for the making of gun barrels by other than casting or welding and forging, as the Damascus barrels were then made.

Boss 1. refers to a raised part or protuberance or the like, and such embellishments are found on both wood and metal surfaces of many weapons. Embossing is the act of raising such features on a surface. See also "checkering" as an ornamentive feature for a firearm. 2. the straw backstop used for an archery target.

Boss Boss & Company of London, England — prominent British manufacturer of high quality side-by-side and over & under shotguns.

Bottleneck cartridge a cartridge whose case tapers to a smaller diameter at the mouth of the case, generally with a pronounced step.

Bottoming 1. the term applied to chiselling out the deep recesses and corners of a gun stock in bringing it to the desired final dimensions. 2. the process of cutting screw threads to the bottom of a blind hole — a job that requires the use of a "bottoming" tap.

Bottom plate the British term for a floorplate.

Bound barrel a barrel that fits so tightly in the receiver of a gun that it has no room to expand when it is heated by the firing of the gun. It also applies to a barrel that is subject to distorting pressures caused by improper stock bedding. A barrel secured by a barrel band to a forearm or forestock is also sometimes referred to as a bound barrel.

Bourrelet (boor LAY) a raised band or ring on the forward part of a projectile that centers the projectile in the bore of the gun and makes it fit closely.

Boutet, Nicholas Noel (1761–1833) a famous French gunsmith, maker of fine arms as well as ordinary firearms, known for the artistic decorations with which he ornamented his guns.

Bow wave See "ballistic wave."

Boxer cartridge a black powder cartridge developed by Colonel Edward M. Boxer of England in the 1860's. It has a coiled brass case with iron head and an anvil type primer. It seats a round nose lead bullet. It was the first centerfire cartridge to be made and used successfully on a large scale.

Boxer, Edward M. (1823–1898) a Colonel (later Major General) in the British Army who, in the 1860's, developed a blackpowder cartridge with a round nose lead bullet, anvil type primer and a coiled brass case with iron head with cap chamber. The Boxer primer is still in universal use and is favored in the United States over the Berdan primer.

Boxer primer a primer in which the anvil is an integral part of the primer assembly. It was developed from the work of Colonel Boxer of the British Army in the 1860's. Used in the United States almost to the exclusion of the Berdan primer and as a result often called the American primer. It is not generally produced in Europe, although British shotgun primers are of this type.

Box lock a 19th century type of lock for rifles, shotguns and pistols characterized by having the hammer inside the lock plate but projecting through between the stock and the lock plate. See "side lock."

Box magazine, semi-fixed a magazine normally contained in the firearm wherein it is loaded but which may be removed for cleaning purposes. Such a magazine is found in certain military semiautomatic rifles such as the Belgian Fabrique Nationale Model 1949.

Bracket the space between two shots or series of shots within which the target lies, i.e., the shots straddle the target.

Brake See "muzzle brake."

Brass an alloy principally of copper and zinc in varying proportions, used for the manufacture of cartridge cases and primer cups. Many antique firearms have brass parts.

Brass coloring the color of brass varies widely depending upon its zinc content, but, like copper, may be given various surface colors by the use of the proper chemical solutions. These colors may, among others, be gold, yellow, white, black, green, bronze or gray.

Brazing (BRAY zing) a method of joining metal parts together with a melted alloy known as spelter solder or simply spelter having the advantage of producing a joint of superior strength. It is almost the same as hard soldering. Brazing joins by a film of brass, a copper-zinc alloy; hard soldering ordinarily by silver solder, a silver, copper-zinc alloy.

Break-action a term sometimes used to describe a shotgun with a hinged frame. See "hinged frame."

Breech the end of the barrel into which the cartridge is inserted. It is a term sometimes applied to the mechanism of a breechloader. "Breech face" is the rearmost surface of the barrel or chamber that meets the breechblock or bolt.

Breech actions may, for rifles, be divided into the following classes: break-open action, lever action, bolt action, slide action, automatic action, semi-automatic action, falling block action, rolling block action.

Breech blast rearward blast of gases from the breech of recoiless weapons upon discharge. Also called back blast.

Breechblock the movable block of metal that closes and seals the breech preparatory to firing the gun. The present day "bolt" is a form of breechblock.

Breech bolt See "bolt."

Breech bore sight a disk with a small aperture in its center fitting snugly in the chamber of a gun. Used with a muzzle bore sight to establish the axis of the bore. See "bore sight."

Breech cover an accessory with which certain rifles may be equipped to protect the action from dirt or water. An example is the sheet metal cover used in the latter part of World War I on the Mauser 98 bolt action rifle.

Breechloader a firearm in which the loading takes place at the rear or breech end of the barrel, as contrasted with the muzzleloader, in which loading takes place at the front or muzzle end of the barrel. Breechloading cannons were in use early in the 15th century, followed about 100 years later by breech loading small arms. Development of repeating arms as breechloaders progressed faster than that of single-shot arms. Not until the American Revolution was a breechloading flintlock (Ferguson rifle) used as a military weapon and then only in a small quantity by the British Army. The Hall rifle patented in 1811 is considered to be the first fairly successful breechloader.

Breech mechanism the mechanical means for opening and closing the breech of a gun and firing the charge.

Breech pin rod a rod communicating the blow of the hammer to the firing pin in early types of magazine rifles.

Breech plug a removable metal insert to close and seal the breech end of a muzzleloading gun. It is removed when access to the breech is desired.

breech plug

Breech pressure is the term often improperly used for "chamber pressure." The pressure exerted at the breech end of the barrel is communicated from the chamber by the head of the cartridge or shot case against the standing breech, breech bolt or bolt, and the amount of force so exerted depends mainly on the area of the case head. Thus, if the chamber pressure is 50,000 psi and the case head .1735 sq. inches in area, the force, called "backward thrust", is approximately 8,674 pounds.

Breech support refers to the ability of the breech block or bolt to back up the head of a cartridge case against the pressure of the discharge.

Bren a .303 air cooled light machine gun adopted in 1935 by Great Britain for use by its army.

Brenneke the name of a rifled shotgun slug made in Germany, consisting of a wad and a soft lead slug joined together. Used for big game hunting. The name Brenneke is also known for the development of certain bullet designs popularly used for hunting purposes.

Bridge mount a mount for attaching a telescopic sight to a rifle; a bridge mount has a one piece base that "bridges" the usual two base-and-ring units with a center bar, thereby assuring proper alignment of the scope-encircling rings.

bridge mount

Bright dip a quick process for restoring the appearance of a badly tarnished brass piece that consists in dipping it in a series of water and acid baths.

Brinell hardness test a means of measuring the relative hardness of metals by the application of a specified load upon a hardened steel ball of known diameter resting on the surface of the metal being tested and measuring the resulting area of the indentation. Brinell hardness numbers relate to the surface area of indent in square millimeters.

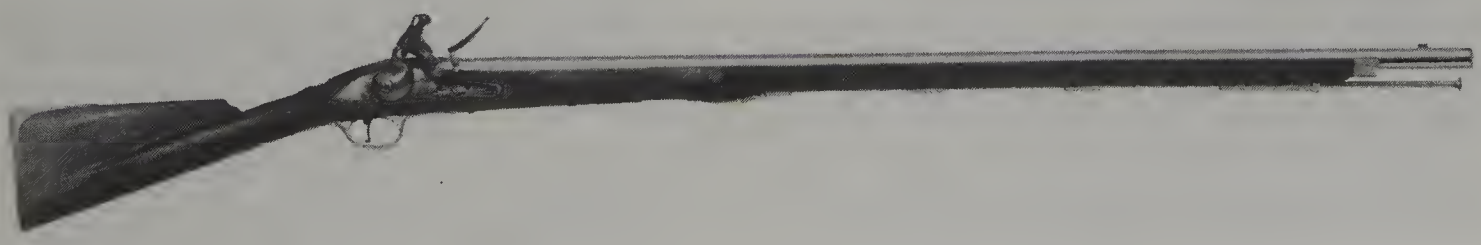
Brisance (bree ZAHNS) the shattering power of a high explosive.

Broaching the use of one or more broaches to cut away metal to achieve the desired form, size and finish. The broach is a tool having a series of teeth of progressively increasing size or height from the starting end so each tooth takes a light cut. It results in a quick accurate reproduction in the metal of the final cutting edges on the broach.

Bronze is a metal alloy, largely of copper with tin, zinc and sometimes lead in varying proportions. Bronze for bearings, for example, might be 82% copper, 16% tin and 2% zinc. Bronze was used in antique weapons for parts and gun barrels and finds use today in instrument manufacture.

Broomhandle Mauser the name commonly given by gun collectors to the Mauser military model semiautomatic pistol whose grip resembles a broomhandle.

Brown Bess a smooth bore flintlock muzzleloader officially adopted by the British Army in 1690 and used during the American Revolution. Its name arose from the fact that its barrel was brown in color. It was the



brown bess

principal arm of British infantry for over 100 years, being replaced by the Baker flintlock starting in 1823. "Bess" was the soldier's familiar nickname for Queen Elizabeth.

Browning the registered trademark of the Browning Arms Company, a corporation of St. Louis, Missouri, and the name by which its guns are known.

Browning an acid and water oxidation process that was used in the 18th and 19th centuries for coloring steel "brown"; this process was the forerunner of our modern gun-blue finishes. See "blueing."

Browning, John Moses (1855-1926) an American gunsmith said to be the inventor and designer of more successful firearms than any other American. Among the numerous weapons of his design, he perhaps is best known for his heavy machine gun and his light automatic rifle, both being military weapons. John M. Browning also achieved considerable success with his designs for automatic pistols, lever action rifles, slide-action .22 rifles, slide action shotguns, automatic recoil operated shotguns and an over and under shotgun.

Browning, Jonathan (1805-1879) an American gunmaker, father of the renowned John Moses Browning. He is noted for his repeating rifle of the harmonica type and for a breech mechanism that contained a six chambered cylinder resembling that of the revolver of his day.

Brushes a barrel bore cleaning tool generally made of brass or bristle for use in cleaning fouling from the bore.

Brush shells (also called brush-loads) a type of shotgun shell developed for use in choke bored guns to provide maximum pattern spread at close range. Also known as a "spreader shell." Generally loaded with number 8 shot, the brush shell is employed by sportsmen who hunt game in dense cover. In this shell, the shot charge is separated into three or four segments by means of horizontal or vertical cardboard dividers.

Brush shooting shooting in heavily wooded terrain.

BT the abbreviation sometimes used for boattail bullets.

Buck and ball a shotshell containing a round ball and three buckshot.

Buck fever a condition of excitement brought on by the sight of game which often unnerves a beginner in hunting.

Buck lure a natural or manufactured scent used by hunters to disguise human odors or to entice deer into shooting range.

Buckshot the largest sizes of lead shot used in shotgun shells and generally employed on game or varmints larger than the usual feathered varieties (except for the wild turkey.) At one time found in many assorted sizes but today generally available only in #00-Buck (.33″ dia.), #0-Buck (.32″), #1-Buck (.30″), #3-Buck (.25″) and #4-Buck (.24″).

Buckskin a tanned deer skin. Before tanning, it would be known as a deer hide. The term "buckskins" also refers to the fringed deerskin clothing historically worn by American frontiersmen.

Buffalo gun the colloquial term for a long gun suitable and used for hunting buffalo in the latter half of the 19th century. Rifles so termed included the rechambered Sharps and Remington rolling block rifles.

Buffer the means provided in a gun for taking up and checking the recoil action of the gun when it is fired or to absorb the shock of recoil.

Buffing wheels are made from disks of bleached or unbleached cotton or woolen cloth that serve to carry abrasive powders such as tripoli, rouge, etc., bonded with a grease or wax. The metal to be buffed dictates the type of wheel to be used for best results.

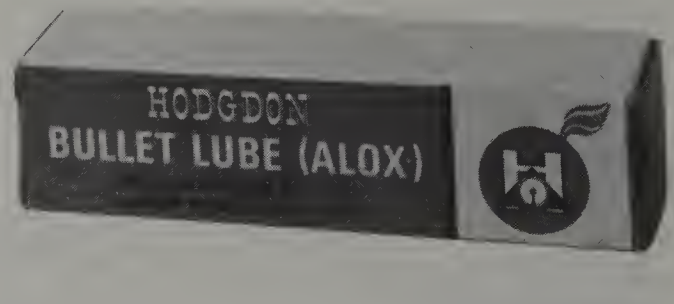
Bulged barrel a barrel enlarged at a place along its length because of the abnormally high pressure built up in the bore by reason of an obstruction that prevents the normal passage of the projectile and following gases out of the barrel.

Bullet a shaped projectile designed to be shot from a firearm.

Bullet casting the process of making round balls or bullets by filling molds with molten lead, or a lead alloy.

Bullet catcher a box or other container filled with water, cotton waste or oiled sawdust to serve as a means for trapping a fired bullet without marring its surface. See "bullet trap."

Bullet drop the normal fall of a bullet during its flight from the gun to the target due to the influence of gravity upon it. A bullet starts to drop immediately upon leaving the muzzle of a firearm under the effect of gravity. See "gravity, force of."



bullet lubricant

Bullet lubricant a lubricant used on cast bullets to reduce leading of the bore of the firearm. Lithium

buckskins

bullet casting

soap greases are satisfactory but special greases having superior qualities are available. See "leading."

Bullet lubricator a tool used to apply a grease-like lubricant to the grooves of cast lead bullets. (The simplest method for lubricating bullets is to stand them in a tray, point up, and pour melted lubricant to the level of the top-most groove. After the lubricant has hardened, a hand tool — shaped like a tube, having an inside diameter slightly larger than bullet diameter and sharpened at one end — is forced over each bullet to cut it free.) Mechanical bench-type lubricators often do additional bullet-finishing work, such as sizing and gas-check seating.

Bullet metal a metal alloy, principally of lead, but mixed with varying amounts of tin or antimony depending upon the degree of hardness desired. Bullet metal, for reloaders, is sold in 3-lb. "billets."

Bullet mould, mold a cavity or series of cavities into which molten lead or a lead alloy may be poured and allowed to harden.

Bullet plug a device used in casting hollow point bullets: that tool which creates the hollow in the bullet nose.

Bulletproof glass a special glass designed to be resistant to the passage of a bullet through it.

Bulletproof vest a vest made of heavy fabric enclosing hardened steel chain, steel plates, or other impenetrable material. Designed to cover a man's torso, protecting it from small arms fire and shell fragments. In military jargon, often referred to as a "flak-vest."

bulletproof vest

Bullet puller a tool used for removing bullets from "live" rounds. Two types of bullet pullers are currently available: one works on the inertia principle and permits re-use of the bullet: the other is a vise-like tool that is surer and faster but which damages the bullet so that it is not suitable for re-use.

Bullet seater See "bullet starter."

Bullet shell an explosive bullet having a bursting charge.

Bullet starter an implement used to assist in starting a bullet into the bore of muzzleloading rifles. Usually it consists of one long hardwood dowel and one short hardwood dowel inserted at right angles into a ball handle, the exposed dowel ends being slightly cupped to fit the bullet. The short dowel is used to start the bullet and the longer one to push it still further into the bore, after which a ramrod may be used to seat the bullet on the powder charge. Also called a ball starter or bullet seater.

bullet mold

bullet puller

Bullet swaging the practice of making bullets by forcing lead slugs into a die under pressure. A system commonly employed today in making semi-jacketed bullets and, when so practiced, the lead slug is contained in a copper alloy cup as it is shaped by the die.

Bullet trap a means for safely absorbing the energy of a bullet in flight and bringing it to a stop in a designated location. To preserve such a bullet for examination in connection with the identification of a firearm, the bullet is fired into a sufficient thickness of non-abrasive material such as cotton waste. Gallery ranges usually employ a steel plate set at an angle to not only absorb the energy of the bullet but to deflect it downward into a pit or receptacle.

Bullet wear the wear in the barrel of a gun caused by the friction of bullets passing through it. This wear is insignificant compared to the destructive effect of the erosion due to the velocity of the hot gases of the propellent powder produced by each firing of the gun.

Bull gun barrel a type of rifle barrel designed for target shooting. Originally intended for long range (1000 yd) big bore shooting, bull gun barrels are now also popular among small bore and benchrest marksmen. Bull barrels are approximately 26-28 inches in length and are made with little or no taper: average diameter at the breech is 1.25 inches; muzzle diameter is rarely less than .875 inches. Guns equipped with bull barrels range in weight from 13 to 20 pounds.

Bull's eye the center of a target. It is also used to describe a shot that hits the center of a target.

Bull's Eye powder a type of powder commonly used as a propelling charge in small arms ammunition.

Burnishing 1. to make shiny or lustrous by means of polishing. In gunmaking, decorative burnishing is often called "engine-turning" or "jewel-indexing", or "jewelling." 2. to secure a smooth finished surface by compressing the outer layer of a metal by applying highly polished tools or by the use of steel balls which, by rolling contact, produce smooth surfaces.

Burnside the name given the breechloading rifle invented by Union General A.F. Burnside, which used a special brass cartridge of conical type.

Burnside, Ambrose Everett a U.S. Military Academy graduate of 1847, best known as a Civil War General. He invented, in 1856, a breechloading percussion rifle. In 1855, he organized the Bristol Fire Arms Co. and, in 1860, after its failure, reorganized it under the name of Burnside Arms Co., which became a substantial supplier of Burnside carbines and Burnside cartridges for the Union Army.

Burnt umber a brown earth containing deposits of manganese and iron oxides. Valued as a pigment. When burnt, it has a reddish-yellow brown color. In gun making it is often used in mixing stains for gunstocks.

Burp gun the knickname given to submachine guns in general during World War II, originally applied to the German Schmeisser. See "grease gun."

Burr hammer a hammer having a projection with a knurled top surface to provide a gripping surface for cocking the gun.

Burst refers to a series of shots fired by a single pressure on the trigger of an automatic weapon; it also may refer to the explosion of an artillery projectile either in the air or on impact.

Burst center See "center of burst."

Burster an explosive charge in a chemical projectile, bomb or mine to open it and spread its contents.

Bursting charge the explosive charge in a projectile, grenade, bomb or mine that upon ignition produces the fragmentation, demolition or other desired actions.

Burst wave the wave of compressed air caused by the bursting of a projectile or bomb, which generally results in extensive local damage. Also called "detonation wave."

Burton, James Henry (1823-1894) an American gunmaker who spent some time in England in the manufacture of arms and subsequently held a commission as a Lieutenant Colonel in the Confederate Ordnance Department. Best known as the man who perfected the French designed Minie ball.

Bushing a sleeve used to concentrically space two parts. An example is the barrel bushing in the U.S.

Pistol caliber .45 Model of 1911.

Busted hulls a local term used in some parts for fired cases.

Butt 1. the end of the stock of a small arms weapon. In a hand gun it is the bottom of the grip, in a shoulder gun the surface that bears against the shoulder of the shooter. 2. the shortened name for target butt, which is a retaining wall placed on the side of a target pit nearest the firing point, with an earth cover facing the shooter.

Butt cap a metal cap to cover and protect the butt of a handgun.

Butt figure a gunmaker's term used to refer to the graining in the butt end of a stock.

Button lock said to be the first improved version of the matchlock. The cock or serpentine after being drawn back was held by sear under spring pressure. By pressing a button, the cock was released to bring the lighted match to the priming. Arriving on the scene about 1500, it continued in use until about 1520 when superseded in the line of development by the pressure lock.

Butt plate screws to secure the butt plate to the stock of a firearm.

Buttstock the rearmost section of a gunstock — that portion which engages the shoulder when the gun is held in a firing attitude — or, the shoulder section of a two-piece stock assembly.

C

Caisson (KAY sun) 1 a two wheeled vehicle used for carrying artillery ammunition. 2. an ammunition chest.

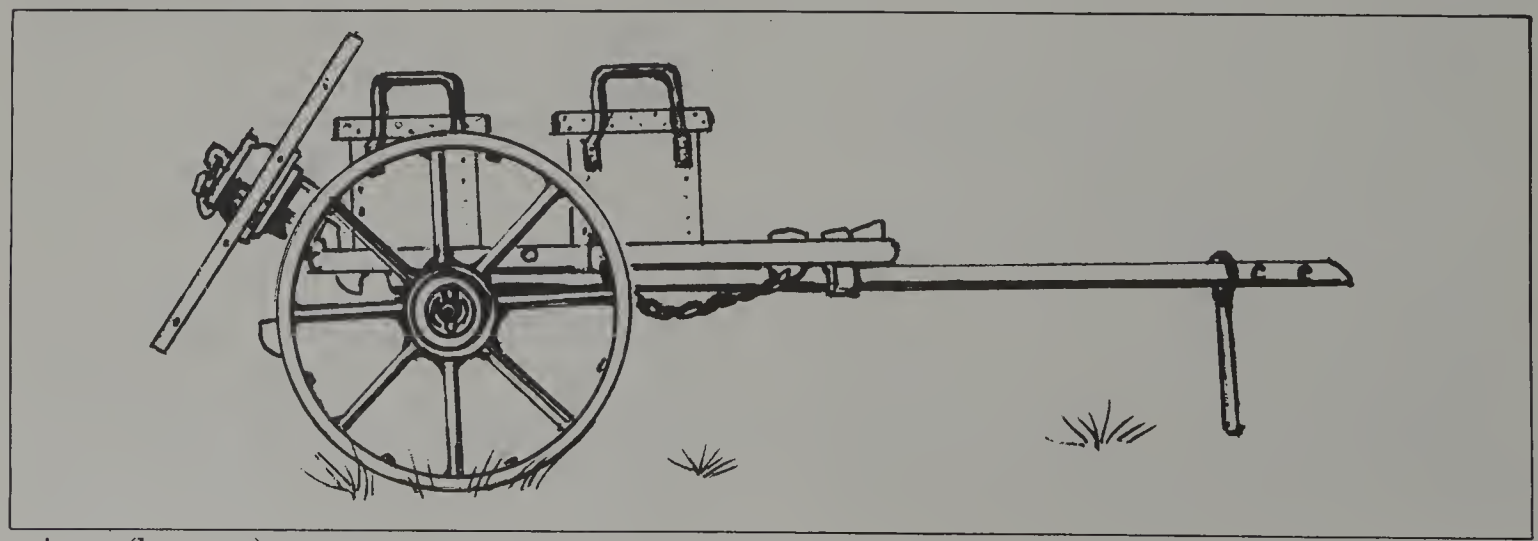
Cal abbreviation for "caliber."

Caliber, calibre 1. the diameter of the bore of a gun, which in rifled bores is the diameter of the land surfaces. It is expressed in decimals of an inch or in millimeters. American gun makers have not always produced guns having the exact caliber by which they are designated by the makers. 2. the diameter of a projectile, although ballistically it may be used to express comparative dimensions. Thus a bullet of "three calibers" has a length three times its diameter. 3. the length of a cannon bore is also expressed in calibers, the caliber being the length of the bore from muzzle to breechblock, divided by the diameter of the bore. Thus, a cannon 20 feet long with a 6″ bore diameter is said to be 40 calibers long and would be referred to as a 6″-40 caliber gun. See "markings."

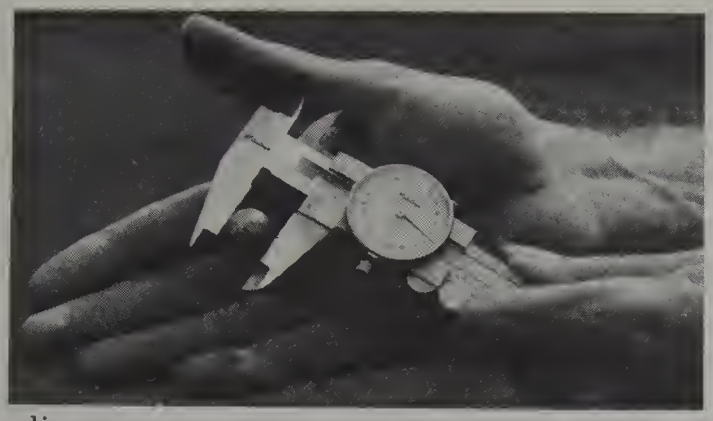
Calibration the comparison of the scale of a measuring instrument with a standard to determine the accuracy of its readings and make the necessary corrections to the scale to make its readings accurate.

Calipers an instrument consisting essentially of two movable arms having opposing contact points that may be brought to bear on the surfaces whose distance of separation is to be measured.

Caliver a 16th century matchlock, a special form of the arquebus, being lighter in weight and fired without the use of a forked rest.



caisson (kay sun)



calipers

Call the shot it is the giving of an estimate or opinion of where the bullet strikes a target before the actual location becomes known. A good marksman will be able to do this accurately by his observation of the position of his sights with relation to the target.

Cam a rotating or sliding piece having a contoured surface or projection to bear against another piece for the purpose of imparting a special or eccentric movement to it.

Camber refers to the slight convexity of a member or part.

Camera gun also called an aircraft camera. It is a camera mounted in an aircraft in a machine gun frame and operated by a trigger. Its function is to make a photographic record of each shot, both in aerial target practice and in combat.

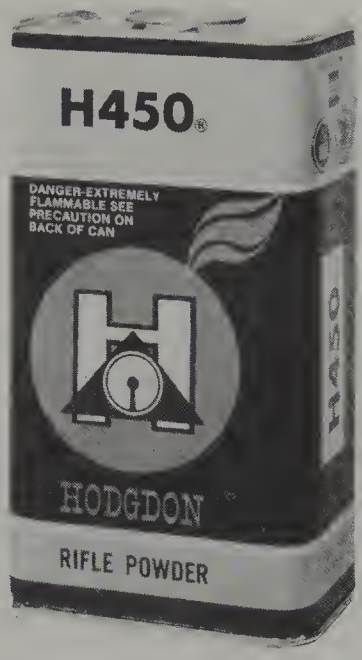
Cám Lock the unofficial name of a single shot breech loading rifle and carbine issued to the U.S. Army after the Civil War and used as late as the Spanish American War. It was based on the design of E.S. Allin for altering the muzzleloaders of the Civil War, the first model being the U.S. Rifle Model 1865. It is characterized by a top hinged breech-block locked by a cam piece at the right rear. This action extracts the fired case and leaves the chamber open for reloading.

Camouflage (KAM a FLAHZH) to disguise a place, person or thing to deceive an observer.

Camp Perry the Ohio National Guard military reservation bordering Lake Erie at Port Clinton, Ohio. Camp Perry is the site of the annual National Matches.

Cane gun a walking stick or cane having a bore from which a projectile may be fired. The handle carries the trigger mechanism, the trigger being concealed in some cane guns. Formerly made in quantity in Belgium, Great Britain and France for gamekeepers, naturalists and poachers.

Canister as used in military arms, it is a metal cylinder containing metal fragments that scatter when the cylinder is ruptured by explosive means.

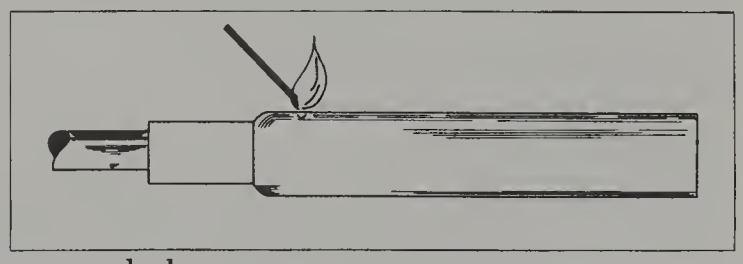


canister powders

Canister powders powders made and suitable for a specified purpose and so called because they are generally packed by the manufacturer in tin cans holding one-half or one pound of such powder.

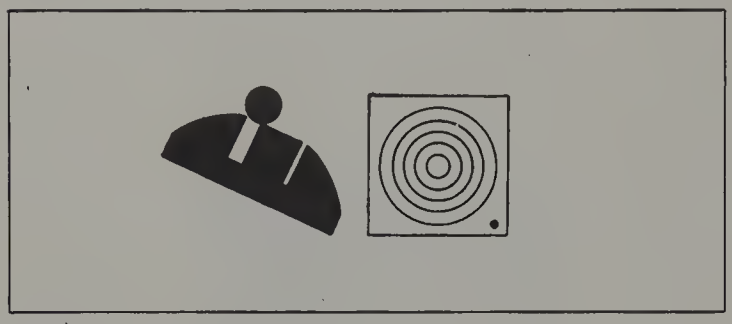
Cannelure (KAN a loor) the name given a circumferential groove in the cartridge case or projectile near its base. When in a cartridge case it is the extractor groove to facilitate the removal of the case from the chamber after firing. When in a bullet it acts as a lubrication groove, a receptacle for metal scraped off in passing through the barrel or as a groove into which the case is crimped to hold the bullet.

Cannon fixed or mobile artillery pieces classified as guns, mortars and howitzers. In general, calibers up to one inch are classified as small arms; 37 mm and greater as cannon. The 20 mm gun, famous as an aircraft cannon, being one of the exceptions. Only as a slang expression does it refer to a hand held firearm.



cannon lock

Cannon lock a hand held or artillery weapon fired by placing a lighted coal, hot iron or hot wire to powder placed in a touch hole located over that portion of the barrel containing the propellent charge.



cant

Cant the sidewise tilting of a gun. Since gun sights are normally in a plane perpendicular to the axis of the bore, the effect is to cause a loss of accuracy which may be considerable at long ranges or with cartridges of substantial trajectory curvatures. The bullet will strike the target in the direction of the cant and slightly downward, the extent of deviation depending upon the degree of tilt. With a constant cant, all other factors remaining the same, successive shots from a gun will tend to strike in the same area of a target.

Cap 1. in percussion guns, a thimble-shaped cup holding a small quantity of detonating powder placed inverted, like a cap on a hollow steel nipple leading to the propelling charge. Patented for the first time in the U.S. in 1822. 2. in toy guns a percussion pellet held between two pieces of paper. 3. a small quantity of high explosive used to set off the explosive charge in a projectile, fuze, mine, etc. 4. the nosepiece on a projectile. 5. a colloquial expression for a BB or CB cap. 6. the British term for a primer.

Cap and ball referred to the cap lock percussion system that employed a cup, called "cap", to hold the detonating powder. The projectile was usually a lead ball and hence the term "cap and ball."

Cap chamber the British term for a primer pocket.

Cap lock a percussion system for muzzleloaders using a cap containing a detonating powder. See "cap."

Capped bullet a bullet that has a protective cap, usually of harder metal, over its nose.

Capper a container or magazine for holding a number of percussion caps and for facilitating the fixing of each upon the firearm nipple as needed.

cap lock

capping tool

Capping tool See "capper."

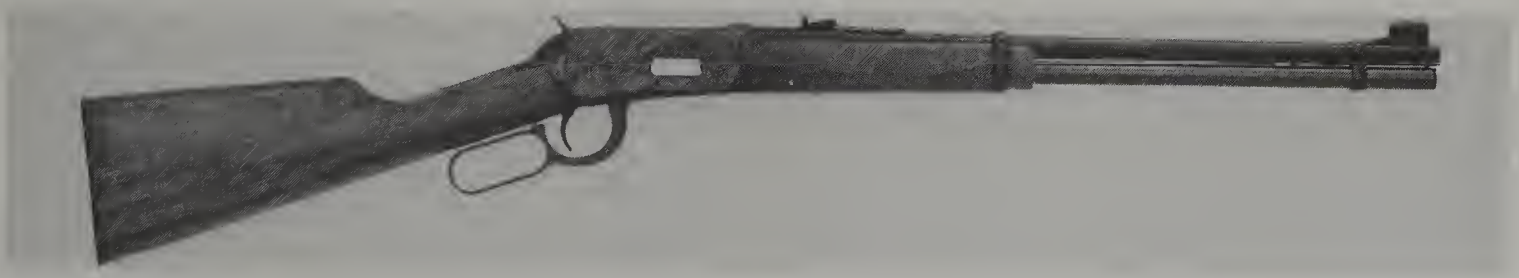
Capucine a band that binds the barrel of a gun to the stock. The word is of French origin and appears in many descriptions of old guns. Capucines were frequently of special shape and decoration.

CAR-15 the designation assigned by Colt's, Inc., to the shortened form of the AR-15 by prefixing the first letter of "Colt" to the "AR-15." It is equipped with a muzzle device to control flash and blast, and has a telescoping stock.

Carbide tipped drills machinist's high speed drill bits equipped with carbide tips to facilitate drilling in hardened steel.

Carbine a short barrelled musket or rifle whose barrel is generally not longer than 22". It is characterized by its light weight and was primarily intended for use by cavalrymen. Its name is derived from the short rifled firearm carried by the French cavalrymen or "carbinieres."

Carbon a chemical element whose chemical symbol is C. It is known in three forms, namely diamond, graphite, and amorphous. Charcoal is in the amorphous form. Charcoal with sulphur and saltpeter (potassium nitrate) was used to make the first gunpowder. The amount of carbon in iron determines its qualities and the name by which it is called.



carbine

Carbon dioxide a colorless, odorless gas whose symbol is CO_2, not only used to extinguish fires but, when compressed in capsules, used to propel pellets from a gun.

Carbon steel a term commonly applied to steel containing no alloying metals to distinguish it from alloy steels containing tungsten, nickel, chromium or other metals. Made by refining molten pig iron, distinguished from cast iron by its malleability and lower carbon content. High grade carbon steels, such as those used in gunmaking, contain only about 1% carbon.

Carborondum the registered trademark of The Carborundum Company for silicon carbide and other abrasives made by it. See "trademarks."

Carburizing See "case harden."

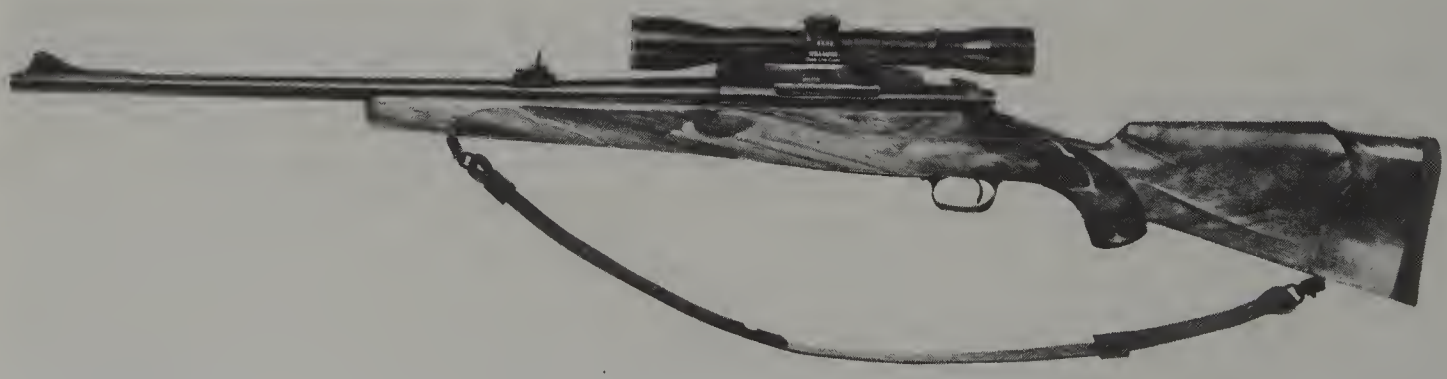
Carcano also known as the Mannlicher-Carcano, an official Italian Army rifle from 1891 to 1945, the first Italian smokeless powder rifle, caliber 6.5mm, six shot repeater.

Carnauba wax a wax obtained from the Brazilian wax palm; used in making varnish, candles, etc. May be used in a mixture of turpentine and boiled linseed oil to make a finishing oil for gunstock.

Carreau (kaa ROE) a type of "bolt", a huge spear-like projectile fired from early cannons. They were also used in launchers like the "espringale." Also known as a "garrot." See "espringale."

Carriage a fixed or mobile support for a cannon. Frequently the word is applied to the carriage inclusive of the elevating and traversing mechanisms.

Carrier that part employed in repeating firearms having self-contained magazines that moves the cartridge from the magazine to a position directly in line with the chamber.



carrying strap

Carrying strap a strap made from leather, webbing, or other similar material and fastened to a rifle or shotgun for carrying purposes. A sling (see "sling strap") differs from a carrying strap in that it is made with a number of adjusting features that serve its function as a shooting aid. Slings are used by riflemen to steady their hold and aim; carrying straps are not particularly suited to this purpose.

Cartridge the complete assembly of a round of ammunition consisting of the primer, case, propellent powder and bullet. In the United States it is used in referring to such rounds used in small arms other than shotguns. Assembled rounds for shotguns are called "shells." In Great Britain the word is used to cover shotgun rounds as well as other assembled small arms rounds.

Cartridge bag a bag containing a propelling charge for use in certain cannons in which separate loading ammunition is used. See "separate loading ammunition."

Cartridge belt a belt for wear on the person and having loops or pockets for carrying cartridges or clips of cartridges.

Cartridge block a block of wood or other material having recesses in its top surface in which cartridges may be placed to be readily available to a shooter for loading. Sometimes mounted on a small bore rifle to enable quick loading without disturbing the firing position or requiring undue movement by the shooter.

Cartridge box a box or pouch suspended from a belt, sling or harness in which to carry cartridges, usually in holes in a wooden block within the box. Used from the early days of firearms until displaced by improved carriers such as the cartridge belt.

Cartridge brass a sheet brass having the composition, 68 to 71% copper, and a maximum of .07% lead, .05% iron, .15% other materials and with zinc the remainder, according to A.S.T.M. specifications B19-29. Used for manufacturing cartridge cases. Each case manufacturer usually has slightly different specifications to meet a desired degree of toughness, hardness and other qualities.

Cartridge case the container that holds the propel-

ling charge, and in fixed ammunition (i.e., assembled rounds) it also holds the projectile and a primer. In addition to its accommodation of projectile, powder and primer, it serves to act as a gas seal to prevent the rearward escape of powder gas. Made of copper, brass, steel, paper or plastic depending upon use, availability of materials and cost.

Cartridge clip in the strictest sense, a clip is a mechanical device that is designed to facilitate the loading of a number of shells into a magazine. The military frequently call this device a "stripper clip" — in Great Britain it is known as a "charger" or "charger clip." A cartridge-feeding device that contains a spring and follower is more correctly called a "magazine." However, over the years the more familiar term "clip" has attained a broader meaning, now encompassing all detachable cartridge feeding mechanisms.

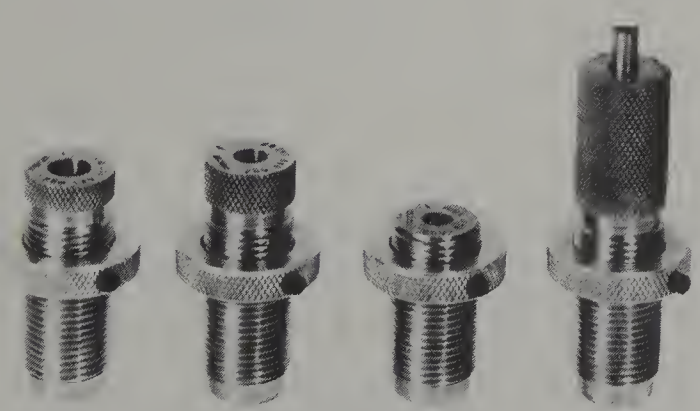
Cartridge equivalents the Appendix lists certain comparable United States and foreign pistol and revolver cartridges.

Cartridge identification visual inspection and the legend on the head of the case are usually sufficient to identify cartridges commercially available today. Measurement and laboratory analysis are employed in the case of obsolete or unusual specimens. The Appendix lists certain U.S. military cartridge visual identification means.

Cartridge interchangeability the Appendix lists certain cartridges that are interchangeable, being adapted to the same guns.

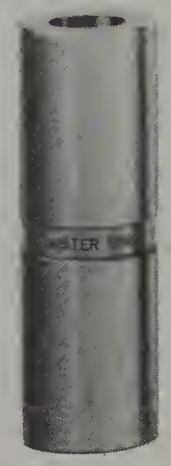
Cartridge stop a device used in the feedway of certain belt fed weapons when blank cartridges are being used. It serves to hold the shorter blank cartridges in the proper position for feeding and also prevents the use of live ammunition. Used in conjunction with blank firing attachments. The term also applies to the live-cartridge holding and positioning device employed in the Browning machine gun.

Case shortened term for cartridge case. See "cartridge case."



case forming

Case forming the practice of making cartridge cases for a specific, often obsolete or wildcat caliber, by reshaping larger cases or straight-walled case blanks in specially constructed case-forming dies. Four characteristics must be common to both old and new, and these are: head diameter, primer cup size, brass thickness and rim type — although oversized rims can often be turned down on a lathe when tolerances permit.



case gauge

Case gauge a jig-like tool that is used to check cartridge casings for length, or diameter, or both. Manufacturers inspect newly made cases with such a device. The practice of reloading fired cases makes this tool especially important to handloading enthusiasts because brass casings tend to stretch under repeated firing and reloading. Handloaders check case lengths after each firing to determine if they must be shortened at the neck. Failure to keep casings within specified minimum-maximum dimensions can lead to dangerous operating pressures. Small bore target shooters often use a special form of gauge to measure only the head diameter and rim thickness of the .22LR cartridge. By matching cartridges with like dimensions from the same "lot" (see "lot number") of ammunition, they minimize variables and are reasonably assured of a consistent standard of performance from shot to shot.

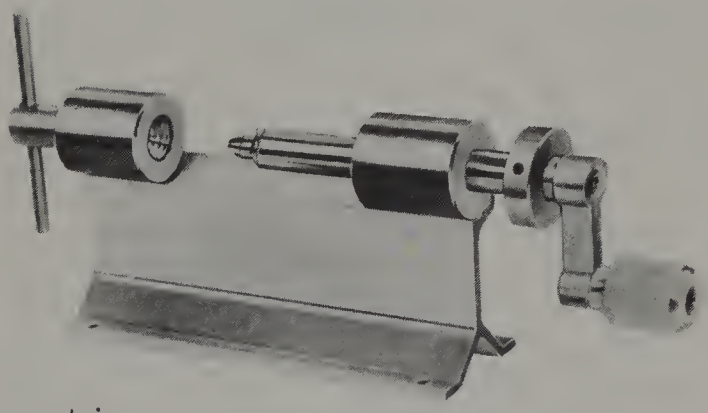
Case harden (sometimes referred to as "case-carburizing" "carburizing" or "cementation.") The formation of a very hard carbon steel "skin," "shell" or "case" to the outer surface of wrought iron, malleable iron or carbon steel by treatment with a carbon-rich medium under high temperature. The depth of the resultant "skin" or "case" generally varies between .005" and .007." In gun making, the carbon-rich medium, called a carbonizing agent, most often consists of a form of

animal charcoal, such as bone-dust, charred horn or charred leather. Case-hardening is generally used only on gun parts that are vulnerable to surface wear. See "carbonizing agent."

Case head the head or base of a cartridge case; that portion of the casing into which the primer is fitted.

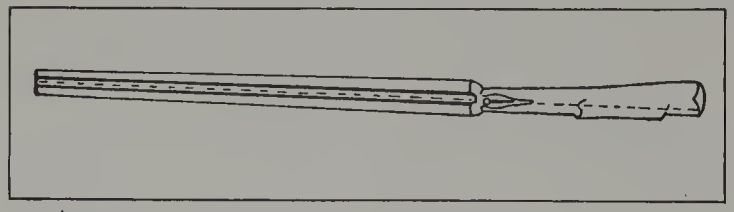
Case life refers to the number of firings a given case can be subjected to if repeatedly reloaded. When a brass casing is worked hard, it tends to thin and elongate rapidly, at the same time acquiring an undesirable degree of hardness which leads to cracking or splitting. To prolong case life, the reloader tries to minimize re-sizing operations, working the case only as much as absolutely necessary to stay within prescribed dimensional limits. Case life can also be prolonged by timely annealing of the case neck which is subject to the most pronounced dimensional change.

Case shot a container holding a number of small projectiles.



case trimmer

Case trimmer a tool used for cutting back the necks of cartridge cases that have been lengthened beyond prescribed dimensions through repeated firing and reloading.



cast

Cast 1. the offset of the butt of a gun from the longitudinal center line of the gun. When the offset is to the right for right hand shooters, it is called cast-off. When to the left for left hand shooters, it is called cast-on. 2. to form a substance by pouring it into a mold and removing it after it has hardened, such as forming a bullet by pouring liquefied lead into a mold and removing it after it has cooled.

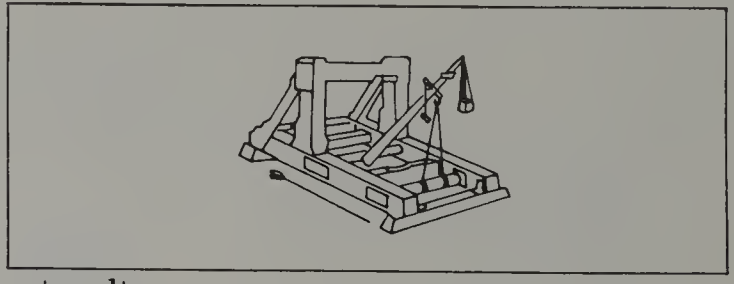
Cast bullets bullets made by casting a lead alloy in a mold. The lead used is often melted with small amounts of tin or antimony, depending upon the degree of hardness desired. Cast bullets are used in low velocity weapons because the heat and pressures generated by high velocity cartridges tends to melt or deform them before they clear the barrel. A hard alloy cup, called a gas check, fitted to the base of a lead bullet, tends to protect it from heat and pressure and permits some increase in powder charge and resultant velocity. However, these pressures and velocities are still far below those employed in propelling fully jacketed bullets. Cast bullets are most often sized and lubricated after casting.

Casting may refer to the process of making a part by pouring or forcing molten metal into a mold or die, or to a part so made.

Cast iron an iron containing so much carbon that it is not malleable at any temperature. It may contain from 2% to 5% carbon but commercial cast iron usually has from 3% to 4% carbon. Cast iron cannot be tempered.

Cast-off a term applied to the shape of shotgun stocks. It is the slight offset of the butt to the right of the center line of the gun to accommodate a right handed shooter. When it is offset to the left it is called "cast-on."

Cast-on a term applied to the shape of shotgun stocks. It is the slight offset of the butt to the left of the center line of the gun to accommodate a left handed shooter. When it is offset to the right, it is called "cast-off."



catapult

Catapult in ancient days a machine for hurling stones, etc. Today it refers to a device for launching planes from the deck of a ship using compressed air or gunpowder as the force to give flying speed to a plane.

Catch, safety See "safety catch."

Cavity 1. a hollow place in shaped charges of high ex-

plosives. 2. the interior of a projectile filled with high explosive. 3. the open nose of hollow point bullets. 4. the recess or recesses in a mold in which the desired product is cast.

CB cap a .22 caliber rimfire cartridge similar to the BB cap and Flobert cartridge but made with a conical bullet. In CB cap cartridges, the bullet is propelled either by a light powder charge or by the priming mixture alone.

Cease firing, cease fire the command or signal to stop shooting.

Cementation See "case harden."

Center-fire refers to a center-fire cartridge whose primer is located in the center of the base of the case, as distinguished from rimfire.

Center of dispersion it is the theoretical center of all the hits that would be made by firing an unlimited number of shots with the same firing data. Actually, it is the center of impact of all shots already fired.

Center of gravity the point in a body at which it is assumed that gravity acts as a single force on the body. The location of the center of gravity of a gun effects its carrying, mounting and behavior when fired.

Center of impact the center of a shot pattern in a target made by a series of rounds fired with the same firing data or from a machine rest.

Centigrade pertaining to a thermometer, is one on which the temperature range between the freezing and boiling points of water is divided into 100 equal degrees. Freezing temperature of zero degrees on a centigrade thermometer is equivalent to 32 degrees on the Fahrenheit thermometer. The centigrade thermometer is used throughout the world for scientific work. The abbreviation for Centigrade is "C."

Centimeter, centimetre a unit of measure in the metric system, being one hundredth of a meter and equal to .3937 inches. One centimeter equals ten millimeters.

Cerrolow a trademark for an alloy of bismuth, lead, tin, cadmium and indium having a melting point of 117°F. It has a negligible expansion and shrinkage factor and has been used to make chamber and bore casts of rifles, shotguns and handguns. Particularly useful when attempting to ascertain the caliber of an unmarked barrel.

C.F. abbreviation for center fire cartridge.

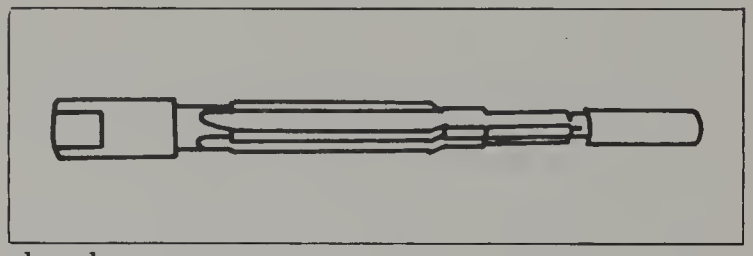
Chain shot a pair of projectiles, round or half round, joined by a short length of chain. Used in sea warfare in the days of sail and wooden ships.

Challenge the privilege given a competitive shooter to protest against what he feels are errors or rule in fractions. A challenge calls for an impartial ruling by a person or persons in authority. Most frequently employed in questioning the scoring of a given shot that is critically placed between two scoring values.

Chamber the enlarged part of the bore of a gun in which the charge is placed. In a revolver it is each of the openings in the cylinder; in most rifles and automatic weapons it is the rearmost part of the bore; in a cannon it is part of the breech. (See "chamber, shotgun.")

Chamber piece the forerunner of the cartridge, employed in matchlock weapons to facilitate quick loading. It was a steel case holding powder, wad and ball, inserted at the breech.

Chamber pressure the pressure exerted in the chamber of a gun by the force of the expanding gases of the propellent powder, sometimes improperly called the breech pressure. The expanding gases in a cartridge case or shotshell exert pressure in all directions, not merely toward the breech end of the barrel, with release of pressure permitted by the expulsion of the bullet or shot, and, in the case of semiautomatic and automatic weapons use of the "backward thrust" to energize the actions.



chamber reamer

Chamber reamer a cutting tool used to form the chamber area of a barrel bore. This is usually a two-step operation calling for the use of a rough reamer and a finishing reamer.

Chamber, shotgun the shotgun chamber is unusual in that it must be manufactured to accept the full length of a shotshell when the crimp is fully opened and extended, as when fired. A 2¾ inch shotshell *does not* measure 2¾ inches in length as it comes from the factory, but it does when it is fired, when the crimp is fully opened. For this reason, shooters often get into trouble when they attempt to "try" a shotshell in an unknown chamber, only to have the barrel bulge or burst upon firing. A 2¾ inch shell will load easily into one of the old 2½ inch chambers, but it will not be safe to shoot. By the same token, a 3-inch magnum shotshell will feed into a 2¾-inch chamber, but it cannot be fired without risk. Older shotguns, particularly those made about the turn of the century, should be checked by a competent gunsmith before any attempt is made to use them. One can, however, use

shells that are shorter than a given chamber, providing the gauge is the same; for example: a 2¾-inch, 12 gauge magnum shell will fire safely in a shotgun chambered for the 3-inch, 12 gauge magnum, assuming all other mechanical factors are normal. Bear in mind that headspace in a shotgun is determined only by the thickness of the rim, not the length of the shell. Varying bore dimensions are so gently tapered they're difficult to detect. We've had the artist magnify the differences here to demonstrate how the chamber flows into the forcing cone and the cone into the bore.

Chambers system named after Joseph G. Chambers, an American inventor, who in 1813 was granted a patent for a system for loading a number of charges into a gun barrel so that ignition of one set off each of the others, save one, in succession. With two locks, one could set off the train of charge, leaving a solid ball to be set off later by the second lock; or the gun could be used as a single-shot arm. It was used in flint-lock muskets and pistols and in match ignited swivel guns on the Great Lakes in the War of 1812 against the British. In principle, this system was anticipated by the espignolle of the 16th century.

Chamfer 1. to bevel 2. a bevelled surface, as between the chamber and throat of a barrel in a firearm.

Charcoal is the chemical element carbon in amorphous form. It was combined with sulphur and potassium nitrate (saltpeter) to make the first gunpowder.

Charge the explosive used to give propelling or bursting effect to a projectile. A "propelling charge" discharges the projectile from a gun; a "bursting charge" within the projectile causes it to fly apart to produce demolition, fragmentation, or chemical action.

Charger the term used in Great Britain for a cartridge clip.

Chassepot, Antoine Alphonse (1833–1905) a French gunmaker and inventor. Best known as inventor of the Chassepot needle gun, a bolt action, breech-loading rifle adopted by the French Army in 1866.

Chassepot rifle an 11mm needle fire percussion lock rifle brought out by the French in 1866 based on the Dreyse Needle Gun design, but characterized by having an obturator of India rubber on the forward face of the bolt and the primer in the head of the paper cartridge.

Checkering the roughened gripping surfaces of a wooden stock that serve ornamental as well as functional purposes. Checkering is made by filing the wood into diamond-like pointed pyramids within a specifically bordered pattern. The number of lines-to-the-inch determines the density of the pattern: the more lines to the inch, the finer and more desirable is the pattern. Many other forms of grip decoration are often used, such as, stippling, flat veining, etc., and these are sometimes erroneously referred to as "checkering" as well.

checkering

Checkering cradle a frame having vertical end supports between which a gun stock may be held while its gripping surfaces are being checkered.

Checkering tools the hand tools used for filing checkering patterns in wooden stocks.

Cheek, cheekpiece that part of the stock of a long gun designed to support the face of the shooter in proper aiming position.

cheekpiece

Chemical analysis the determination of the constituent elements of a substance. If only the elements are identified, it is called a qualitative analysis; if the percentage of each element is also determined, it is called a quantitative analysis. For example, if an analysis of brass in a cartridge case shows the presence of copper and zinc, it is a qualitative analysis; if it shows that it contains 70 percent copper and 30 percent zinc, it is a quantitative analysis.

Chemical element is a substance that cannot be separated from itself by ordinary chemical means. The Appendix lists some important chemical elements.

Cherry 1. a milling cutter for making circular or spherical impressions in dies. Used by manufacturers in making bullet molds. 2. a timber tree, sometimes

known as a black cherry tree, (genus prunus serotina). Cherry wood is highly valued in the manufacture of furniture and is occasionally used in making gun stocks.

Chert a compact rock basically of microcrystalline quartz from which gun spalls were fashioned, capable of striking a spark for the ignition system of a flintlock.

Chilled shot also called "high antimony shot" made of lead with antimony added to harden the pellets. It has replaced the drop shot made of lead only.

Chisel, wood a metal tool having a cutting edge at the end of a blade for shaping wood. Wood chisels come in many forms, those in greatest use by gunmakers are the corner, butt, firmer, carving, gouge and bottoming chisels.

Choke the muzzle constriction in the bore of a shotgun barrel that serves to condense the shot pattern. For purposes of identification, various degrees of constriction are given choke ratings, as follows:

American Chokes	*European Chokes*	*Constriction in Points***	*Choke Length**	*Typical European Barrel Marks*
Cylinder Bore	Cylinder	none	0	(CL)
Improved Cylinder	¼ choke	10	5/8"	(****)
Modified	½ choke	20	1¼"	(***)
Improved Modified	¾ choke	30	1⅞"	(**)
Full	Full	40	2½"	(*)

* (Choke length) — this dimension varies from one maker to the next and is largely dependent upon the choking method employed. These dimensions are offered for illustrative purposes only.
(** One point is equivalent to one-thousandth of an inch.)

This table gives approximate choke values because there are no hard and fast rules for bore and choke sizes. The result is that slight variations will be found from one manufacturer to another and often from one gun to another within a given model. This is especially true where skeet chokes are concerned: the terms Skeet #1 and Skeet #2 may denote any degree of constriction between cylinder bore and improved cylinder. Length of choke (taking into consideration the cone and parallel sections) may also vary according to the experience of the individual maker. Diagrams of the four conventional choke systems. Top to bottom: the swaged choke, the American choke, a variation of the American choke and the English or standard choke. The fifth choke, at the bottom, is the relatively new and highly acclaimed "Tula choke" designed specifically for skeet shooting. This is the choke employed in a number of foreign-made skeet guns and which first attracted attention by winning the skeet event at the Olympics held in Munich. (Drawings are exaggerated.) With the Tula choke, dimensions at the muzzle, directly under the front sight, are actually larger than the bore dimension. This, theoretically, lengthens the shot column because the leading pellets escape the bore without interference. Following pellets detour into the jug-like recess, delaying departure from the muzzle. (Some American makers may now be using the Tula choke.)

Chokebore the bore of a shotgun provided with a choke. See "choke."

Choke, cut See "cut choke."

Choke, jug See "jug choke."

Choke reamer a cutting tool, not unlike a drill bit, with long tapered cutting edges of a size to cut metal from the choke portion of shotgun bore.

Choke, swaged See "swaged choke."

Chopper lump an English term for a barrel-making technique that forms the locking lugs (for a double barrel shotgun) as an integral part of the barrels. Generally, side by side shotgun barrels are made with a lug assembly that is brazed or soldered to the underside of the barrels. Chopper lump construction is believed to be stronger.

Chord a straight line joining two points that lie on a curve. Thus the straight line that forms the base of the curved path of a projectile is a chord.

Chrome molybdenum steel (mo LIB da num) an alloy steel containing chromium and molybdenum, used in the manufacture of better grade gun barrels. Chrome molybdenum steel has a very high melting point and is particularly desirable for barrels that are to be subjected to soldering (as when fitting ribs, etc.). Familiarly referred to as "chrome-molly."

Chrome plating depositing by electroplating, a protective and ornamental coating of the metallic element chrome on a metal surface. The coating produced is almost as hard as diamond and highly resistant to corrosion. The bores of some gun barrels and other gun parts subject to extreme wear have been plated to secure those qualities.

Chrome steel a high carbon steel alloyed with chromium, also called chromium steel. The chromium increases the hardness of steel making it useful for both armor and armor piercing projectiles.

Chromium is a steel gray, very hard but brittle corrosion resistant metal element whose chemical symbol is Cr. Alloyed with steel, it imparts hardness and toughness to it, causing it to be used for armor plate and other ordnance and weapons manufacture where those qualities are desired. To prolong barrel life, chrome plating of the bore has been resorted to.

Chronograph an electronic instrument used to measure the velocities of projectiles. It measures and records small intervals of time. The first chronograph

was invented by Captain Paul le Boulenge of the Belgium Army.

Chronograph grid See "chronograph screen."

Chronographing measuring the velocity of a projectile by the use of a chronograph.

Chronograph screen or grid, the circuit-completing wire cords or plates which, wired to the chronograph, are placed at precisely measured distances in the bullet's path. A chronograph employs two screens: when the first is penetrated the chronograph starts the timing sequence; when the same bullet penetrates the second screen (which is positioned a specific distance behind the first) timing stops and the operator can then calculate the speed of the bullet. Usually new screens are required for each shot. Some modern chronographs employ photo-electric cells in place of screens.

Classification of guns guns are classified in numerous ways to distinguish them by period of development, size, ignition systems, loading methods, uses, etc.

Clay target a circular disc of frangible material, such as hardened clay, scaled through the air by a launching device called a "trap" to provide a flying target as used in skeet or trap shooting. Regulation targets must measure no more than four and five-sixteenths (4 5/16") inches in diameter, nor more than one and one-eighth (1 1/8")inches in height, and must weigh 3.5 ounces, however, a variation in weight of up to 5% is allowable. First clay pigeon targets were patented in 1880 in the U.S. by George Likowsky. First trap throwing of clay pigeons took place on June 12th, 1900 in the borough of Queens, New York.

Clean a colloquialism employed by target shooters to denote a perfect score.

Cleaning bolt a cleaning device usually employed only for .22 caliber match rifles. Made of metal or hardwood it fits into the receiver in place of the regular bolt, extending into the chamber in the case of center fire rifles and only to the barrel breech in the case of rim fire rifles. A hole having the same diameter as the bore of the rifle and coaxial with it, extends the length of the bolt. Purpose of the cleaning bolt is to permit a cleaning rod to pass through it and the bore of the barrel without rubbing the bore just ahead of the chamber. See "muzzle guard."

Cleaning brush a brush or pad on a rod, cable or string, used to clean the bore of a firearm.

Cleaning patches square or round pieces of absorbent material (usually flannel) of appropriate size and weight for use with cleaning rods to clean the bore of a gun.

Cleaning pullthrough a cord or cable provided with a brush and/or patch holder at one end for cleaning the bore of a barrel. Its value lies in its light weight and ease of handling. A patch becoming wedged in the barrel, either attached or detached while being drawn through, might present an obstruction impossible to dislodge with the flexible pullthrough.

Cleaning rod a rod having a brush, cloth or other attachment at one end, for cleaning the bore of a gun barrel. A one piece stainless steel rod at least 6" longer than the combined length of the barrel and receiver and having a rotatable handle is considered ideal as a cleaning rod for rifles and handguns. For shotguns of 20 gauge and larger a wooden rod is considered satisfactory.

Clear to make certain no ammunition remains in a gun or to remove stoppages that interfere with the firing of a gun.

Clearance in the manufacture of a firearm it is the space allowed between the moving parts of a gun, as for example between the bore of a gun and the cartridge. It may also refer to the elevation of a gun at such an angle that when fired its projectile will not strike an obstacle between the muzzle and the target. See "angle of clearance."

Climometer rest a device placed in the bore of a gun to support a clinometer, used to measure the angle of elevation of the gun. Also called a bore rest.

Clip See "cartridge clip."

Clip guides slots let into the sides, barrel extension, or receiver to permit the insertion of the edges of a cartridge clip and firmly engage it for loading. Sometimes called "ears" in gunsmith's jargon.

Clip loading machine a machine for loading cartridges into a clip.

Clock-face method See "clock method."

Clock method a method for designating direction from a central point that uses an imaginary clock face as a reference. Thus, to call a shot, the center of the target is considered the center of an imaginary clock face and the hit, if directly above, is at 12 o'clock, if directly to the right, at 3 o'clock. To refer to wind direction the observer is at the center of the imaginary clock, so that if the wind comes from the right it is called a 3 o'clock wind. It is also called the clock-face method or the clock system.

Clock system See "clock method."

Closed-breech action a term generally employed with fully automatic military firearms, meaning that the weapon is cocked and ready to fire when the breech is closed over a chambered cartridge with the safety off. This is contrary to the action of most fully automatic military weapons which are designed to fire from an open breech position. Sporting firearms are exclusively of closed-breech design.

CM abbreviation for centimeter.

CO_2

CO_2 the chemical symbol for carbon dioxide.

Coach an instructor or one to whom an instructor in forearms has delegated certain duties in target shooting. See "coach and pupil method."

Coarse sight the alignment of the sighting devices of a firearm so that the entire front sight is visible through the notch in the rear sight; a less accurate alignment than a "fine sight." See "fine sight" and "full sight."

Coated lens an optical glass lens coated with a material that enhances light transmission qualities. See "lens coating."

Coated shot lead shot that has been coated with copper by electroplating to make it harder and less likely to lead the bore.

Cochran a breech loading rifle considered an oddity, having a turret type revolving cylinder usually with 7 or 8 chambers for feeding paper cartridges to the receiver. Invented by John W. Cochran and made by the firm of Allen and Cochran in the mid 19th century.

Cock the condition of a gun when it is ready to fire, or the act of putting it into such condition. Thus, in a gun having a hammer, it is in a pulled back position, ready to fire. A half-cock position is one in which the hammer is mechanically held in a less than full cock position and unable to fire. In early days it referred to the predecessor of the hammer. The term is also used to refer to the jaws of a flintlock hammer.

Cocking indicator a pin projecting from certain rifles, shotguns, combination rifle-shotguns, and semiautomatic pistols to indicate by sight and touch that the hammer is cocked. Also called a signal pin.

Cocking lever a mechanical part of the firing mechanism of certain guns that moves the firing pin back into firing position preparatory to firing the gun.

Cocking piece the rearward extension of a striker or firing pin that, in some guns, extends from the rear face of the receiver or barrel extension, external of the gun so it may be grasped and pulled back to cock the gun.

Cocobolo a colorful South American wood that is frequently used in making decorative forend tips and pistol grip caps for gunstocks.

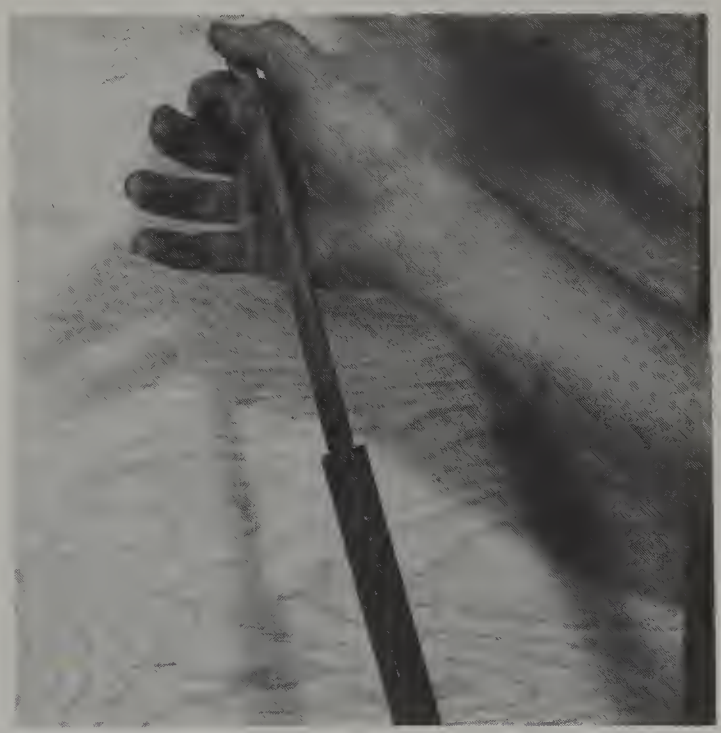
Coefficient in general is a number by which some other number is multiplied and in physics is a number that expresses the amount of change or effect under certain conditions of length, temperature, etc. See "coefficient of expansion."

Coefficient of expansion in the case of linear expansion, it is the number that represents the amount of expansion per unit of length due to each increase of one degree in temperature. The coefficient of cubical or volumetric expansion is the number that represents the amount of expansion per unit of volume for each degree of increase in temperature. In each case, if given the coefficient of expansion, it must be known if it is based on the Centigrade or the Fahrenheit temperature scale. See "expansion."

Coefficient of form a term used in the science of ballistics. It is a number that serves as an index to the shape of the point of a given projectile. Generally, the sharper the point, that is its shape from point to maximum diameter, the more efficient it is. See "ballistic coefficient."

Coffee mill carbine a Sharp's carbine provided with a coffee mill, with a detachable handle in its butt, assembled during the Civil War at the U.S. Arsenal in St. Louis. It was intended that one be issued in each company of soldiers. Relatively few carbines were so altered.

Cold blueing a term used by gunmakers and gunsmiths to describe non-immersion type blueing proc-



cold blueing

esses where blueing chemicals are swabbed on uniformly heated steel surfaces. For this reason the term is something of a mis-nomer since the only truly "cold" blueing is that employed for touch-up purposes. For gunsmith's "cold blueing", the material must often be boiled in a degreasing solution or heated uniformly over a clean flame.

Cold drawing the process of drawing cold metal bars of round, square or hexagonal cross section through dies to improve the physical properties of their surfaces and produce bars of accurate dimensions.

Cold forging a process by which a metal block is squeezed down to the desired shape. Used in making odd shaped metal gun parts.

Cold rolled steel steel that has been passed through rolling mills while cold, resulting, among other advantages, in producing a so-called "bright" finish as contrasted with the oxide scale formed when steel is rolled hot.

Cold weather lubricant See "lubricant, cold weather."

Collar a band or ring used as a spacer or to limit motion.

Collier, Elisha H. an American gunmaker and inventor who had to take his flintlock rifle, chambered like a revolver, to England to obtain recognition. He was granted a British patent in 1818. His action was also used in shotguns and in pistols and later made in caplock and pill lock.

Collimate (COL i mate) to bring the line of sight of a gun parallel with the axis of the gun barrel. In the case of binoculars it means bringing the two telescopes into optically parallel relationship.

Collimation the state of having the line of sight of a gun parallel with the axis of the gun barrel or in having two telescopes or binoculars optically parallel.

collimator

Collimator an optical device employed by gunsmiths to align the sights of a firearm with the bore, to minimize sighting-in efforts.

Color case hardening a process for the surface hardening of steel that results in a decorative mottled-color finish. This finish is attained by packing the component into a steel box together with a generous amount of charred bone, then heating the entire unit to a temperature of approximately 1400°F for two hours or more. Upon removal from the heating ovens the part is quenched quickly in cool, soft water. A marbleized red-yellow-blue color results. See "case harden."

Colt the trademark of Colt's Inc. for its firearms, the first having been the single action revolver invented by Samuel Colt.

Colt .45 automatic the term commonly applied to the seven shot semi-automatic pistol produced by Colt's Inc. commercially and for the military. Adopted by the U.S. Government in 1911 as its basic, standard sidearm, it was modified in 1921 and then designated the M1911 Al.

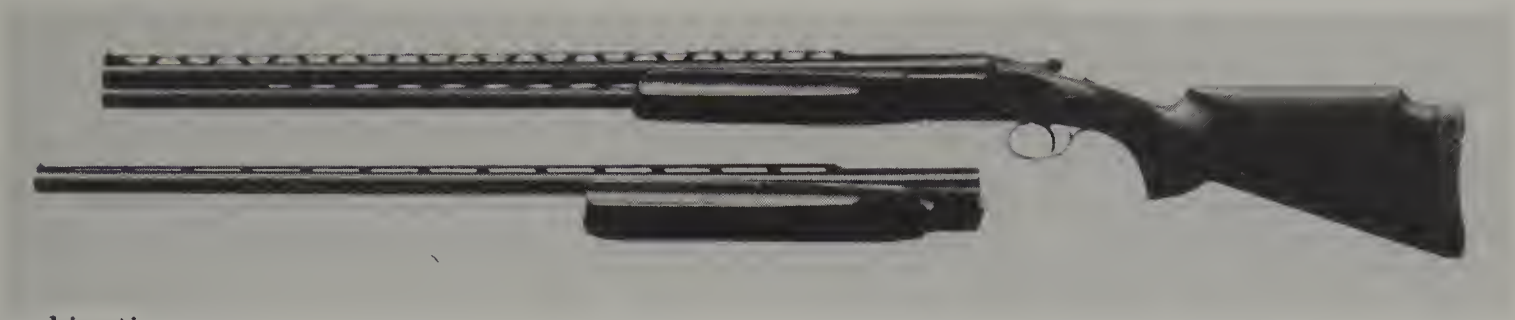
Colt revolver Samuel Colt, at the age of 21, patented his famous revolver in 1835 (in the United States in 1836). Said to have been conceived by him when, five years earlier, he was on a sea voyage. The principles embodied in it were not new but he combined them in a simple, rugged, practical construction that found a ready market. The leading feature of this single action handgun was the automatic rotation of the cylinder when the hammer was cocked, presenting in succession the chambers of the cylinder to the firing mechanism.

Colt, Samuel (1814-1862) an American designer and manufacturer of firearms. Best known for his revolver design, the original having been patented in the U.S. in 1836, in England in 1835. It was the first practical gun with a cylinder that was revolved and locked by the action of cocking the hammer.

Comb the crest or topmost ridge portion of the stock of a rifle or shotgun. That portion of a gun stock upon which the shooter's cheek rests.

Combat arm 1. a branch of military service whose basic function is to engage in actual fighting with an enemy. 2. a firearm designed specifically for military or police combat purposes.

Combination gun a firearm made to handle more than one size of ammunition. Generally accomplished in an over-and-under styling with two barrels of different caliber. In Europe, combination guns are popular when made with one rifle barrel in conjunction with one or two shotgun barrels. In the latter instance, a three-barrelled gun is the result and this is called a "Drilling" gun. While not a combination gun



combination gun

in the strictest sense, the over & under shotgun used for trapshooting, made with an interchangeable single barrel unit for "singles", may be called a combination gun, as can the skeet gun produced with interchangeable barrels of assorted skeet gauges.

Combustible capable of combustion.

Combustion the chemical union of oxygen with other elements and compounds usually at such a rate that flame and heat are produced. When it is extremely rapid it is called an explosion; when the union is slow it is called oxidation.

Commence firing the command or signal to begin shooting at once.

Comparison microscope an arrangement in one assembly of two microscopes with an optical bridge between them so one-half of the field seen by a viewer comes from one microscope, the other half from the other microscope. First used in firearms identification procedures in April of 1925.

Compensator a muzzle brake commonly used on cannon; now often used on some types of shotguns and automatic weapons to reduce the upward jump of the muzzle as well as recoil. It consists of a metal tube or bore slightly larger than the bullet or shot charge, screwed to the muzzle. Its wall has a series of openings at right angles to the bore, of selected patterns, designed to cause the muzzle blast to exert forward force in opposition to the backward recoil movement of the gun when it is fired. The Cutts Compensator is an example.

Complete round all of the ammunition components, such as the primer, the propelling charge, the cartridge case and the projectile, required to fire the gun once. When assembled as one unit it is termed a "fixed round"; "shot shell"; or "metallic ammunition." When loaded into a gun separately it is termed "separate loading ammunition."

Component an essential part of the whole, such as the trigger in a gun or any one of the numerous parts that make up a firearm

Compound bullet the British term for a jacketed bullet.

Concussion the sudden and violent disturbance of the air caused by an explosion.

Cone 1. the sloping portion of the rear of the choke at the muzzle of a shotgun. 2. the forcing cone in a shotgun barrel is sometimes merely called "cone."

Cone of dispersion the coneshaped pattern formed by the paths of a group of shots fired from a gun with the same sight setting. This pattern is caused by the variable factors such as, ammunition, wind changes, gun vibration, etc. Also called "cone of fire" and "sheaf of fire."

Cone of fire See "cone of dispersion."

Cone sight a front sight of cone shape.

Conical bullet broadly refers to any pointed bullet but more appropriately applies to a pointed lead bullet used in muzzleloading arms. May contain one or more grease grooves with a solid flat base. Conical bullets made for caplock revolvers are designed with one oversize circumferential ring that is slightly sheared upon loading.

Conoidal bullet a bullet that is cone shaped.

Contact bedding (as opposed to "free floating.") The practice of bedding a rifle in a stock so that a pressure contact is made between the wood and specific areas of the metal components. In bolt action rifles, three specific points of the barrel and receiver assembly require this form of contact if the weapon is to function accurately. These are, 1. the rearmost portion of the receiver, 2. the point at which the barrel joins the receiver (including the area of the recoil lug) and, probably most important, 3. the area of the forend tip. In "free floating" a barrel, only the receiver assembly makes firm contact with the wood.

Continuous fire fire conducted at a normal rate without interruption for adjustment corrections or other reasons.

Conversion the alteration of a gun to some other use or method of operation. Conversion of military weapons to sporting use by reducing barrel length and alteration of the stock is an example. Conversion from percussion to cartridge ignition, another. See "adapter."

Conversion table a chart or tabulation of figures that shows for one system of measurements the equivalents in another system of measurements. For example, the metric equivalents of "inches" such as shown in the appendix of this book.

Cook-off a cartridge said to "cook-off" is one that is fired by the heat of the gun, a condition usually encountered with rapid firing military automatic weapons when the barrel is seriously overheated.

Cookson a type of repeating flintlock that used a repeating system credited to a Florentine gunmaker in the mid 17th century, Michele Lorenzoni. A John Cookson made such a gun in England about 1670–1680 and a John Cookson, relationship unknown, made such guns in the American Colonies around 1756.

Copper a soft, ductile metal element whose chemical symbol is Cu, prized for its immunity to corrosion in the atmosphere and high electrical conductivity. It alloys freely with other metals, particularly zinc, to form brass and, tin to form bronze. By suitable treatment it may be made very strong or very tough and malleable. Brass, an alloy of copper and zinc, is extensively used for cartridge cases and primer cups. Copper has been used to plate lead bullets of small caliber to prevent bore leading.

Copper clad steel a steel surface coated with copper by either alloying the copper to the steel by applying the copper in a molten state or by welding to the surface by applying in a plastic state.

Copper hardening as practiced by the ancients, consisted of cold working the metal by hand hammering. Today, in addition to the cold working method, a second method exists, that of alloying the copper with any one of a number of other metals.

Copper jacketed a bullet made with a full copper jacket, occasionally having an exposed lead tip when made for hunting purposes.

Copper sulfate also called blue vitroil or bluestone, whose chemical symbol is $CuSO_4$ *$5H_2O$ is in the form of blue crystals soluble in water. It may be used for coppering objects (i.e. applying a thin coat or "wash" of copper) and in copper plating solutions.

Cordite a double base smokeless powder, slow burning, made of guncotton, nitroglycerin and mineral jelly, developed in Great Britain by following the footsteps of Alfred Noble's patented propellent "Ballistite." Originally made in a cord-like shape from which it got its name. Still used in modified form in Great Britain.

Cord wick a cord made from hemp and treated with slow burning chemicals used as the igniter on matchlock weapons.

Core the central part of a bullet, generally an alloy of lead.

Corned powder the early name given to gunpowder made of saltpeter, charcoal and sulphur, ground wet and formed into grains. This type followed the dust-like powder previously ground dry and called serpentine powder.

Corrected azimuth a term in usage with artillery fire. It is the azimuth from the gun to the target after making allowances for winds, condition of the gun, and other variable factors. Also called "corrected deflection."

Corrected deflection See "corrected azimuth."

Corrected range a term used in artillery firing. It is the actual range after allowances have been made for weather conditions, ammunition variation and other factors that cause departure from standard conditions. It is the range at which the projectile is calculated to hit the target.

Correction any changes made that depart from what are considered standard or ideal conditions to compensate for variable factors such as wind, temperature, wear, etc.

Corrode to eat away gradually such as by chemical action induced by humidity, presence of acids, etc. Modern ammunition with its noncorrosive primers and propellent powders has practically eliminated corrosion from that source. See "corrosion."

Corrosion the effect of corroding or corrosive agents. Moisture on metal parts of steel will cause rust to form and when rust is permitted to form, pits will develop causing a roughened surface. In the bore of a gun the passage of a bullet will be impeded, the shape of the bullet slightly deformed and fouling will increase. Companion evils are abrasion, erosion, fouling and leading.

Corrosion resisting steels are steels having in common a chromium content and corrosion resistant characteristics, commonly referred to as stainless steels.

Corundum an aluminum oxide found in nature in many variations, the gems ruby and sapphire being of the transparent variety while impure-granular and massive forms are known as emery. Corundum, as the term is generally used is neither, since it does not have the impurities found in emery and it possesses a larger percentage of crystalline alumina which gives cutting quality.

Coslettizing a process for rustproofing iron or steel in which the subject material is immersed in a bath of near-boiling, phosphoric acid in which iron or zinc filings have been dissolved. The thickness of the protective coating thus provided depends upon the length of time the work remains immersed and may range from thirty minutes to three hours.

Cosmoline the registered trademark of E.F. Houghton & Company for a liquid rust preventative cleaner

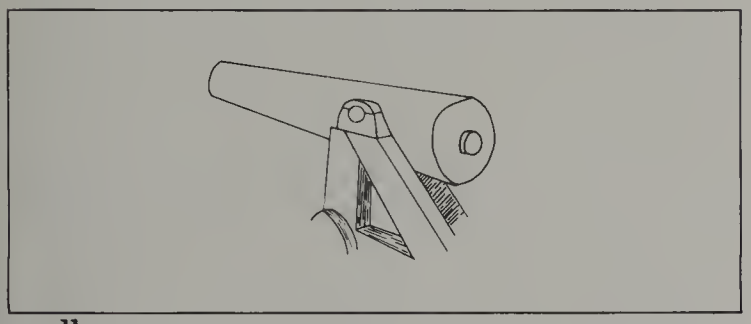
and fingerprint neutralizer for use in protection of steel parts between processings on machine operations. Sometimes the term is improperly applied to a heavy grease used to coat firearms when prolonged storage is anticipated.

Counterrecoil the forward motion of a gun to return it to firing position after having moved backward due to recoil.

Counterrecoil mechanism the mechanical, hydraulic, or pneumatic system that returns a gun to proper firing position after recoil. Also called "recuperator" or "recuperator mechanism."

Covered primer a primer widely used in Europe in which the outer cup or face of the primer completely encloses the inner cup instead of leaving it exposed as in the American type. Generally refers to shotshell primers.

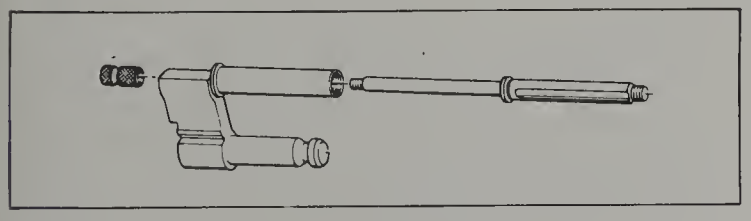
Crack shot a common expression for a proficient shooter.



cradle

Cradle a supporting framework for a gun of weight or size for which a tripod or bipod would be inadequate. See "bipod" and "tripod."

Cradle, gunstocker's a device designed to hold a gunstock in a manner permitting rotational adjustment. Like a lathe in principle, most gunstocker's cradles are made with a center point that engages the leading surface of the forend and a clamping device that secures the butt. In this way, the stock may be rotated a full 360° and, since it may be locked in any given position, the stockmaker has easy access to all stock surfaces.



crane

Crane or yoke, being that part of a revolver having a swing-out-cylinder which is pivoted to the frame and upon which the cylinder and ejector rod are mounted.

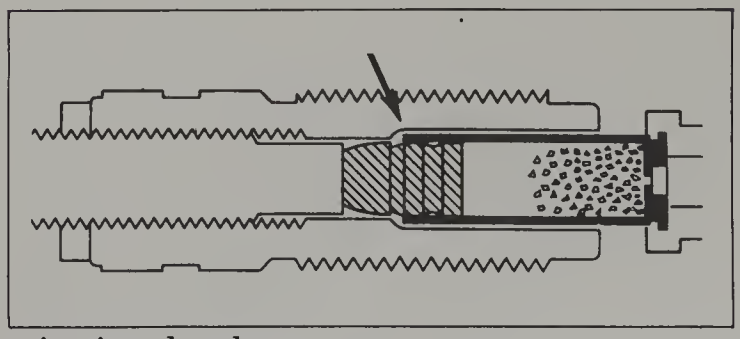
Crank in some automatic pistols, a bent arm that, when the breech mechanism recoils, acts as a lever to compress the recoil spring housed in the grip. After the expanding propellent gases have lost their force, the spring restores the action in its forward position and loads and locks the gun. Sometimes called a "bell crank."

Crease a line or mark made in the skin by a projectile, bomb, or shell fragment in flight, similar to that made by folding a pliable piece of material. Used to describe a slight wound.

Creep any small movement caused by looseness, wear or vibration in movable parts. This is a term especially applied to such a movement in the trigger of a gun.

Crimp the inward bend or lip of the mouth of a cartridge case to grip the bullet and hold it in place. In the case of a shotshell, to hold the top wad and thus the shot, in place, or to hold the base wad in position. A rolled crimp is one in which the mouth of the case is turned inward around its entire circumference. A star crimp or indent crimp is one in which a number of indents are formed in the circumference of the encircling mouth, or in the case of primers, the edge of the primer pocket.

Crimped primer (a misnomer). A term frequently used to describe a cartridge case having a crimped primer pocket. This crimp is stamped into the lip of the primer pocket when the primer is seated, the purpose being to lock the primer in place and facilitate water sealing. Found almost exclusively in military cartridges, this feature was recently discontinued by U.S. arsenals when it was found that lacquer sealing was adequate and that there was no real need to lock-fit primers.



crimping chamber

Crimping chamber that part of a cartridge loading die that serves to crimp the neck of the case around the bullet. This practice is often important to loading

operations for pistol or revolver cartridges. Few rifle cartridges require bullet crimping — generally only those that are intended for use in tubular magazine guns where there exists some possibility that, under recoil, a cartridge will recess the bullet of the shell behind it.

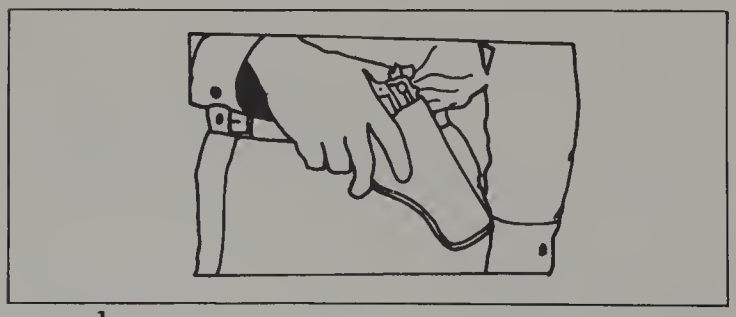
Crimping groove the groove around an artillery projectile for crimping the cartridge case to the projectile. It is analogous to the cannelure in the jacket of a bullet.

Cripple stock a stock offset to the left or right of the axis of the bore and bent to the extreme to permit a shooter to fire from his right shoulder while sighting with his left eye, or vice versa.

Crosman the dominant feature of the registered trademark of Crosman Arms Company, Inc., manufacturers of air and CO_2 (gas) guns, located in Fairport, New York.

Crossbolt a form of shotgun lock originally conceived by the W.W. Greener Company of London, England. A Greener type lock is identified by a top extension that protrudes from the chamber area of the barrels into a fitted recess in the face of the breech. The top lever of the action actuates a crossbolt that slides to the left (at right angles to the axis of the bore) and passes through a hole or slot in the top extension. Some crossbolts are shaped like cylindrical pins while others are more or less bar-shaped. A properly fitted crossbolt does much to strengthen the locking mechanism of break open type firearms, however, too many cross bolts are not properly fitted — do not really engage the top extension — and are therefore really only ornamental.

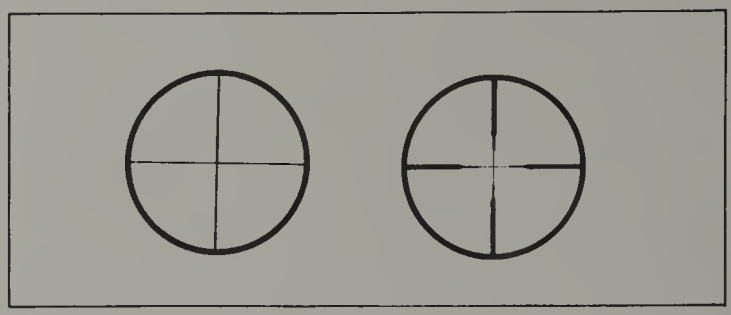
Cross-cut file a file having one round edge with sides tapered toward the opposite edge and being single cut. That is, single rows of parallel teeth extending across the face at an angle of from 65 to 85 degrees with the axis of the file. Used to file saw teeth and similar surfaces.



cross draw

Cross draw the practice of using the opposite side hand in drawing a handgun from a holster, i.e., drawing a revolver holstered on the left hip with the right hand, or vice-versa.

Cross fire intersecting fire from two or more positions.



cross hairs

Cross hairs the crossed lines that a viewer sees in looking through a sighting telescope and which, centered on a target, establishes the line of sight. Cross hairs have been made of hair, spider webs, fine platinum wire or other finely drawn material, almost invisible to the naked eye, mounted in the telescopic instrument on a ring called the reticle.

Crossing target a moving target that crosses the line of sight at any angle. A shooter must aim ahead of, or lead, the target so that the paths of the target and bullet will meet.

Cross level to level a weapon such as a mortar at right angles to the line of sight.

Cross split bullet a metal cased bullet having two slits in the jacket that criss cross the nose of the bullet for the purpose of improving its ability to expand on impact.

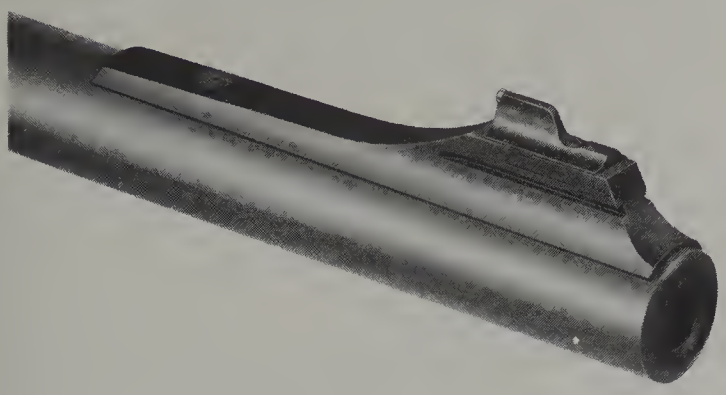
Crosswind a wind blowing at right angles to the intended flight line of a bullet, i.e., a three or nine o'clock wind direction. While any wind direction can prove troublesome to the shooter, sporadic gusty winds are far more disconcerting than a heavy, though consistent wind.

Cross wires See "cross hairs."

Crotch figure the generally outstanding, irregular, grain pattern common to a stock blank cut from the crotch of a tree.

Crown the bevelled edge common to the muzzle of a barrel.

Crowning the act of bevelling the edge of a barrel muzzle; a task that requires considerable care. A carelessly executed crowning job can ruin the performance of a rifle. By the same token, some rifles that give poor accuracy for inexplicable reasons, can often be corrected by simple cutting and re-crowning of the muzzle.



crowning

Crusher gage a mechanical means for holding a cylinder of copper or lead in juxtaposition to the chamber or bore of a gun to expose it to the gas pressure generated by a fired cartridge. The gas pressure compresses or crushes the cylinder and the cylinder, being of known dimensions and composition, the pressure can be computed from the amount the cylinder is compressed. Two types are in general use. In the United States the "radial" system; in England, the "oil case" system.

Culverin a two-man hand cannon of the early 15th century (about 1430 to 1460), measuring about five or six feet in length of bore and firing only a .70 or .80 caliber ball. It was supported on the back or shoulder of one man called the collineator, or aimer, and fired by the incendiarius, or firer.

Cup primer an early primer that required a blunt nosed hammer to crush the rim of the cartridge where the priming mixture was contained. In limited use in the mid 19th century.

Cupronickel (COO pro NICK ell) a copper-nickel alloy in the proportions of about 60 percent copper and 40 percent nickel, formerly extensively used for bullet jackets. Largely replaced by gilding metal in the 1920's. Being white in appearance, it was often called "German silver."

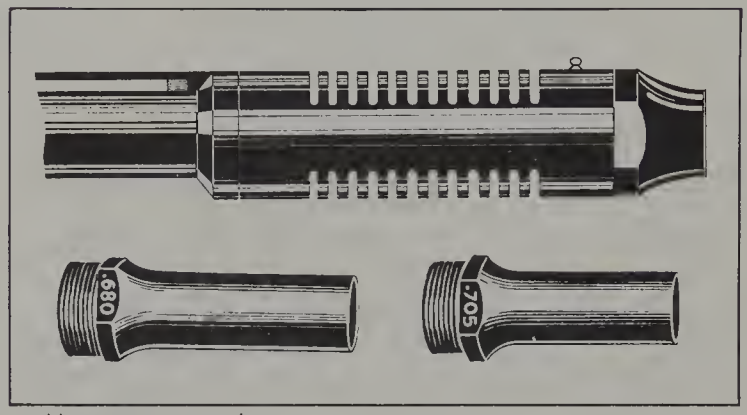
Curvature the condition or state of being curved, such as the curvature of the trajectory of a projectile in flight.

Curved barrel a design for a military rifle perfected by the German Army in World War II for shooting around corners.

Cut choke a choke formed during manufacture of the barrel of a shotgun by a reamer during the final ream of the interior of the barrel.

Cutlass pistol a rare antique pistol made by Morrill & Blair and called Elgin's Patent Percussion Cutlass Pistol, having a 3-inch barrel, 12 inches overall length, and a 7-inch knife blade 1" in width, mounted beneath the barrel. The rear end of the blade serves as a trigger guard. The term is sometimes applied to any pistol having an attached knife.

Cut-off 1. in the military sense, a mechanical device incorporated in certain automatic weapons to restrict them to semiautomatic or single-loader operation. 2. in the sporting sense, a mechanical device that is employed in tubular magazine guns so that only one shell will feed onto the carrier (or lifter) with each cycle of the breech mechanism.



cutts compensator

Cutts compensator a muzzle attachment for shotguns made with a ventilated sleeve and designed to accept choking sleeves of various sizes interchangeably. In addition to providing the shooter with a selection of chokes for one barrel or gun, the Cutts compensator also serves as a recoil reducer. It is particularly popular among skeet shooters. Originally developed by Colonel Richard M. Cutts (USMC Ret.) as a muzzle depressor for the Browning Automatic Rifle and the Thompson Machine Gun. Manufacturing rights were acquired by the Lyman Gun Sight Company of Middlefield, Connecticut in 1929. The Lyman company has since manufactured and distributed the Cutts compensator for shotguns without interruption.

Cyanide hardening a very effective, quick process for the hardening of small parts. Components are heated until red, dipped in powdered potassium cyanide, and quenched in clear water. For added hardness, the part may be heated and dipped repeatedly before quenching. Potassium cyanide is a very deadly poison and cannot be allowed to enter the eyes, mouth or a break in the skin.

Cycle an interval of time in which a sequence of events is completed, such sequence reoccuring regularly. In automatic fire the sequence of events that make up one cycle are those which load, fire, extract and eject the empty case.

Cyclic rate the rate of automatic fire expressed in terms of shots per minute. The maximum rate of fire of an automatic weapon.

Cyclic rate mechanism also known as cyclic change mechanism. A device on an automatic gun, such as the Browning automatic rifle, by which the rate of fire can be controlled, to reduce or increase it.

Cylinder stop the recesses in the cylindrical surface at the rear of a revolver cylinder into which a lever, housed in the frame, is engaged to stop the rotation of the cylinder so that it is properly aligned and locked in position with one chamber behind the barrel.

D

DA abbreviation for double action.

Dag an old name for a shot pistol, especially a wheel-lock. It was in use in England and Scotland in the 16th and 17th centuries being eventually displaced by the word "pistol."

Dagger pistol another name for a knife pistol.

Damascene, damaskeen is the finish given iron, steel or bronze by making furrows in the surface and then hammering a wire, usually gold, into them to form a decorative scroll or design. The term is often confused with "Damascus barrel" and with "Damascus steel", terms to which it bears no relationship.

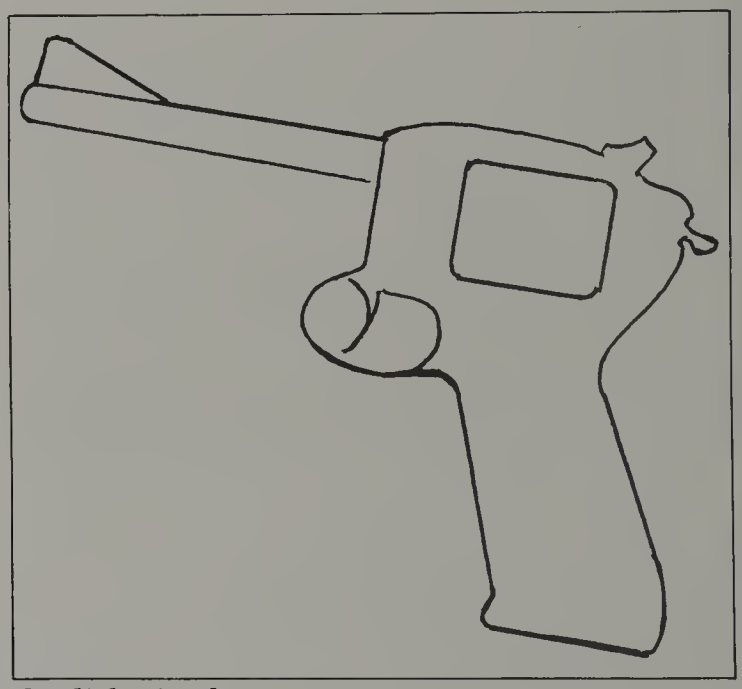
Damascus barrel also known as a "laminated" or "twist" barrel. Made of two or more rods or wires of iron and steel, called skelp, welded together, then rolled to form a ribbon and twisted about a mandrel with the abutting edges of the ribbon hammer welded together. After withdrawing the mandrel the welded tube was finished inside and out to form the finished barrel. This method of making gun barrels appears to have started in the 16th century in the Near East.

Damascus steel is characterized by having surface patterns of wavy parallel stripes or mottled patterns attributed to irregularly disposed carbon in the metal. It was produced in India and Persia and exported to Europe in the Middle Ages. Once thought to be the result of welding together rods or wires of dissimilar steels, as was done in the making of Damascus barrels.

Danger flag a bright red flag flown on firing ranges as a danger warning when firing is going on.

Danger space 1. the space in which the trajectory of a small arms bullet does not rise above the average height of a man. 2. the space around the bursting point of a shell hazardous to personnel.

Dardick the name of a unique cartridge and weapons system named for its inventor, David Dardick. Briefly manufactured and marketed in the mid 1950's by the Dardick Corporation of Hamden, Connecticut. The unusual design of the Dardick pistol, combining features common to the revolver and the automatic pistol, had a cylinder containing three compartments (chambers) fed by a 15-shell capacity clip-type magazine. The cartridge was made with a unique triangularly shaped plastic casing. Lack of commercial interest forced the closing of the Dardick plant after but a few years of operation.



dardick pistol

Darne (DARN) the name of Regis and Pierre Darne, French gunmakers and inventors, one of their first inventions being a gas operated, lightweight machine gun developed during World War I. Today the name identifies firearms made in France by the Darne firm, in the town of St. Etienne.

Dart gun an air or CO^2 powered rifle or pistol designed expressly for indoor target shooting with darts.

dart gun

darts

Darts the darts used in air or gas guns for indoor target shooting, generally in .177 caliber.

Datum the basis for measurement or calculation, such as datum plane, which is taken as a plane of reference from which elevations are measured. Sea level is often used as such a plane of reference. In the firearms field, the datum line is a point found on the sloping shoulder of a bottlenecked cartridge case from which headspace dimensions are ascertained.

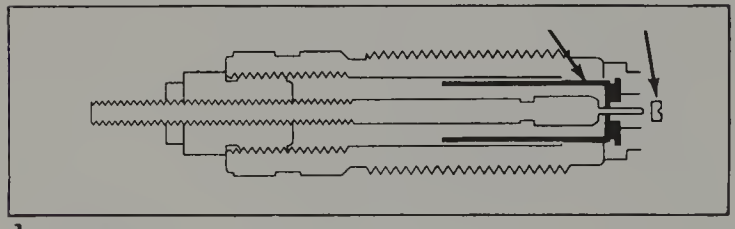
Deactivation rendering an explosive shell or charge inert by removal of the priming element, such as the fuze or detonator. Also a term applied to the procedure followed in rendering a firearm incapable of performing its intended function.

Dead shot a colloquial expression for a shooter who always, or nearly always, hits what he aims at.

Deburring tool a small handtool used by reloaders to de-burr, and slightly chamfer, the rough case neck edges that result from case trimming.

deburring tool

Decapper a tool that is used to remove spent primers from cartridge cases that are to be reloaded.



decapper

Decibel (DES i bell) a unit of measure used in evaluating sound levels. Measurement is made by a sound level meter. As an example of some measurements, a purring cat about 25 decibels, a quiet business office about 40 decibels, average street traffic approximately 100 feet away, from 60–70 decibels, a gunshot about 100 decibels, a boiler shop about 130 decibels, just below the limit of the endurance of the human ear.

Decoy a lure or bait designed to entice game into gunshot range. This term is most commonly associated with waterfowl hunting where artificial likenesses of ducks or geese are set out by the hunter to attract the birds. The likenesses are appropriately called "decoys."

Definition See "resolving power."

Deflagration an explosion whose power builds up smoothly and evenly as contrasted with "detonation."

Deflection the distance a hit is off target, to the right or to the left, due to wind, variations in ammunition or movement of gun or target. It also refers to the setting on the scale of a sight that allows for such conditions so that when the sight is aligned with the target, the gun is pointed sufficiently far to the right or left of the target to cause it to be hit.

Deflocculated graphite is a lubricant comprising finely divided graphite suspended in water or oil, which prevents rusting of iron or steel.

Degreasing removal of grease, oil or other foreign matter from a firearm through washing in a cleansing agent, such as: boiling water, a solvent, or a 25% solution of hydrochloric acid. Degreasing is the first step in blueing or browning firearms.

Degree 1. a unit of angular measure equal to 1/360 of a circle. 2. a unit of measurement for temperature which, in the case of a Fahrenheit thermometer, is 1/180 of the temperature range between the freezing and the boiling temperature of water. In the case of a Centigrade thermometer, it is the unit of measurement for temperature which is 1/100 of such temperature range.

Delayed blowback operated See "retarded blowback action."

Deliberate fire a rate of fire slower than normal to permit better judgement of its effect and thereby to facilitate more precise adjustment of sighting instruments.

Demihague a 15th century cavalry weapon about half the size and weight of the harquebus and adapted to be discharged by a mounted man. The muzzle end was supported on a forked rest fastened to the saddle bow; the other end had a ring that permitted it to be suspended by a cord from the neck of the cavalryman. Powder was ignited at the touch-hole by means of a slow match.

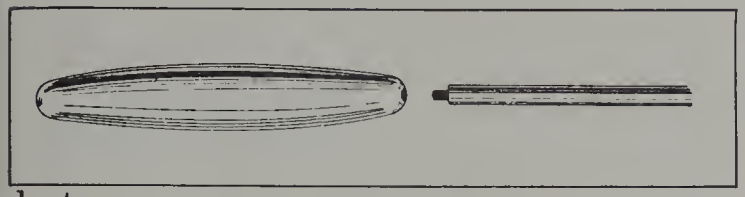
Demolition the act of demolishing or destroying, especially by explosives.

Demondion, Augustus a French inventor who, in 1830 was granted a patent for a breech loader having a lifting breech block hinged at the front and what is considered to have been the forerunner of the successful pinfire cartridge.

Density of any substance whether solid, liquid or gas is the mass weight of that substance per unit volume. When, as in scientific circles, it is expressed in grams per cubic centimeter, the density will for all practical purposes be equal to the specific gravity.

Density of loading the ratio of the weight of the powder in a cartridge case to the weight of the powder the case can hold if filled to the base of a seated bullet, ex-

pressed percent. There is authority for calculating the density of loading by taking the ratio of the weight of the powder charge to the weight of the amount of distilled water at 39.2 degrees Fahrenheit that would fill the powder chamber.



dent remover

Dent remover a gunsmithing tool used to remove dents from shotgun barrels.

Deplating the act of removing a plated coating (such as nickel, chrome, or cadmium) from a metal such as steel. Because the removal of plating by polishing is generally slow and frequently results in damaged edges, most gunsmiths use a simple electro-chemical deplating process. This consists of sulphuric acid, distilled water, a glass tank, a storage battery, copper wires and a lead plate designed to act as a cathode. The work to be deplated serves as the anode.

Depress to lower the muzzle of a gun.

Depression angle See "angle of depression."

Deringer, Derringer (DER in jer) 1. a "Deringer" refers to any one of the guns made by Henry Deringer, Jr., a Philadelphia gunsmith. Originally a single barrel, muzzle loading percussion type pistol. 2. "Derringer, " used by competitors of Deringer, has come to mean all tip-open pocket pistols of short barrel and large caliber.

Deringer, Henry (1786–1868) an American gunsmith and manufacturer of firearms. Made famous by the short single shot percussion pistol he first made in 1825, but which was never covered by patents issued to him.

Descending branch the path of a projectile in its descent from the highest point in its flight. The path from the muzzle up to the highest point is called the ascending branch.

Desert ironwood common to the American Southwestern desert, this is an extremely hard, durable wood, that is occasionally used in making forend tips and grip caps, etc., for gun stocks. Ironwood is heavy, has a deep brown-black color, and is most difficult to work.

Detent a catch, pawl, dog or similar piece that, generally under spring loading, engages a moveable part and holds it in place until disengaged.

Determinate error an error of such nature that its cause can be determined and appropriate allowance made for its effect.

Deterrent See "inhibitor."

Detonate to explode both suddenly and violently.

Detonating agent an explosive capable of being detonated and used to set off another explosive, also called a detonating charge; fulminate of mercury and tetryl are examples.

Detonating explosive See "high explosive."

Detonation an explosion that is sudden, violent and practically instantaneous. A slower action is called a "deflagration." See "deflagration."

Detonation wave See "burst wave."

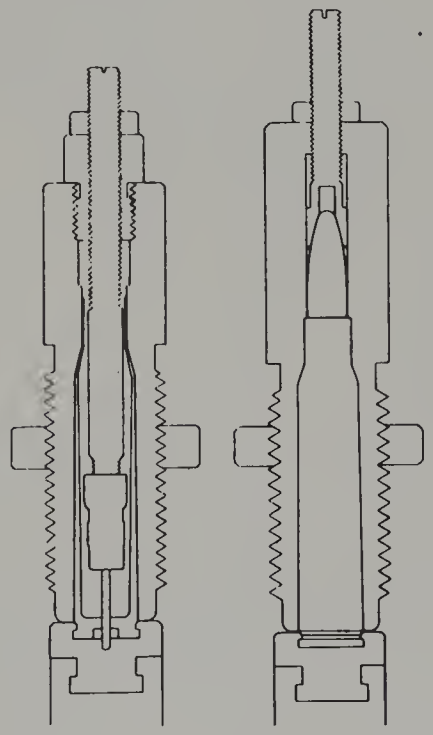
Detonator 1. the name given in past years to a gun fired by a percussion cap. 2. a device or charge used to set off the main charge in a projectile, mine, bomb, etc.

Deviation the distance of a hit from the target expressed as an angle or by linear measurement.

Dewat a term used to refer to a firearm that has been rendered permanently inoperative. Often employed by collectors of machine guns but may be used to refer to any firearm so altered.

Diameter 1. any chord passing through the center of a figure or body. 2. the length of a straight line passing through the center of a figure or body. 3. the diameters most often a subject for firearms users are barrel, bore, bullet, lead, neck, rim.

Diaphragm in optics, is a plate having a hole in it, or a ring, placed in an optical instrument to control the amount of light passing through it.



dies

Die a tool used to size or form an object or material. Used in hand loading of ammunition to size cases and bullets, seat bullets, etc.

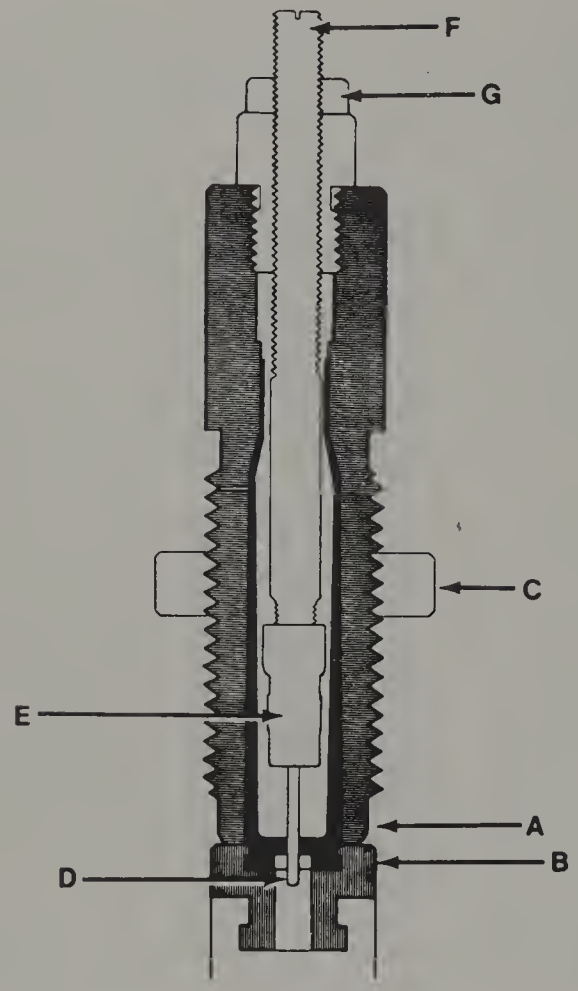
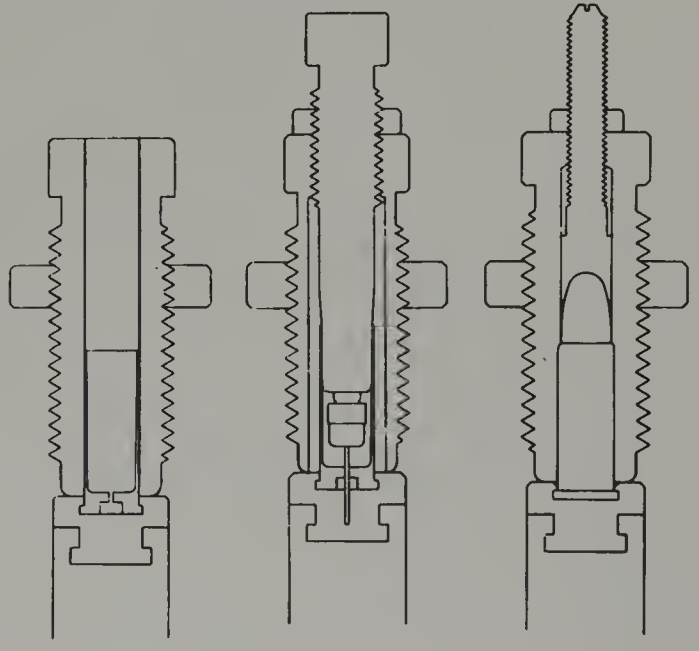


Diagram of an RCBS sizing die: A—mouth of die body; B—shell holder; C—locking ring; D—decapping pin; E—expander button; F—expander-decapping rod; G—rod lock-ring. (Solid black area represents cartridge casing. Gray area is die body. White areas are internal or external fittings.)



dies

Die casting is the casting of molten metal under pressure in a metal mold or die.

Diffraction an apparent disturbance or modification in a light's rays caused when passing close to reflective surfaces, opaque bodies, or through narrow slits.

Dimick, Horace E. (circa 1811–1873) an American gunsmith and manufacturer who furnished many firearms used in the winning of the West.

Diopter, dioptre a unit of measure used to indicate the power of a lens. It is equal to the reciprocal of the focal length in meters.

Diopter scale a focusing scale — such as that often found on one of the eyepieces of a binocular — which serves to indicate the degree of convergence or divergence of the light rays emerging from the optical instrument.

Diphenylamine test See "paraffin test."

Dipper a ladle-like handtool used by bullet casters to ladle molten lead from the pot to the mould.

Direct fire an artillery firing term describing fire in which the sights of a gun are brought in direct line with the target. Also called fire by direct laying.

Direct hit a perfect hit on the target. Also called a "bull's eye."

Director of Civilian Marksmanship a commissioned officer of the Army or of the Marine Corps detailed by the President of the United States to serve as such under the direction of the Secretary of the Army.

Direct pointing an artillery term akin to "direct firing" describing the pointing of a gun in direction, or in both range and direction, by means of a sight directed at the target.

Disarm 1. render a gun or explosive device impotent. 2. take away the weapon of an opponent.

Disassemble to take apart a firearm for cleaning or repair. To "take down" a gun is to disassemble it.

Discharge to cause a weapon to fire.

Disconnector a mechanical feature of an automatic pistol which prevents the gun from being fired unless the action is entirely closed, and prevents the firing of more than one shot for each pull of the trigger.

Disc primer a tiny copper disc containing fulminate exploded by the fall of a hammer to ignite a propellent charge. Invented by Christian Sharps in 1852.

Dispersion a scattered pattern of shots fired from the same gun with the same firing data.

Dispersion error the variation in a series of shots fired from the same gun under firing conditions kept as constant as possible. In practice, the dispersion error of a shot is considered the distance to that shot from the center of impact of the group or series of shots.

Dispersion ladder a tabulation showing the probable distribution of a series of shots made with the same

firing data, usually in percentages of shots falling in several zones.

Dispersion zone the area over which shots scatter when fired with the same sight setting.

Displode, displosion to explode or strike apart with violence. Rarely used in reference to weaponry.

Distinguished Badges awards for excellence in marksmanship, in the form of badges known as "Distinguished Rifleman" and "Distinguished Pistol Shot", may be achieved in individual competitions in accordance with pertinent service regulations. The highest 10 percent of the nondistinguished competitors in the individual rifle and pistol competitions of the National Trophy Matches will receive credit points toward distinguished designation in the following manner: Civilian and ROTC competitors — qualify when they have earned a minimum of 30 credit points for EXCELLENCE-IN-COMPETITION in authorized matches. Once credit "leg," included in the required 30 credit points, must be earned in the National Trophy Matches or in lieu thereof, the civilian competitors must apply for Distinguished Badges through the Director of Civilian Marksmanship, Room 731, Old Post Office Bldg., Washington, D.C. 20315. Military competitors — (includes all service personnel as well as National Guardsmen, reservists, service academy cadets and midshipmen) may earn "Distinguished Rifleman" or "Distinguished Pistol Shot" badges in accordance with the pertinent regulations of their respective services.

Distinguished marksman a soldier who has won three badges or medals for rifle fire in competitions designated by the Department of the Army.

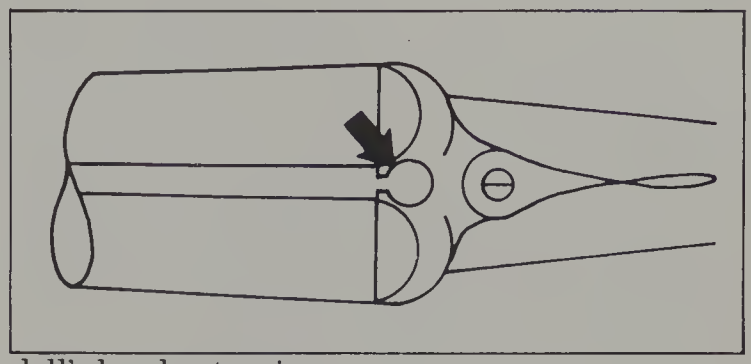
Distinguished Pistol Shot a badge awarded for Excellence-In-Competition to civilian pistol shooters under the program of the National Board for the Promotion of Rifle Practice, and to military personnel under the pertinent regulations of their respective services. See "Distinguished Badges."

Distinguished Rifleman a badge awarded for Excellence-In-Competition to civilian riflemen under the program of the National Board for the Promotion of Rifle Practice and to military personnel under the pertinent regulations of their respective services. See "Distinguished Badges."

Doghead the vise-like device on a flintlock hammer (i.e., cock) used to hold the flint in place. Also known as "jaws."

Dog lock an improved English lock which had a safety or dog catch to secure the half cock position when the shooter so desired. Many variations have appeared since about 1600 and for about 250 years thereafter.

Doll's head extension a form of "top extension" made with a circular tapered knob which fits into a corresponding recess in the top of the action. A very efficient form of lock for double barrel shotguns and other similar hinged barrel weapons. See "top extension."



doll's head extension

Dot reticle the aiming point of a sighting instrument, such as a telescopic sight, that is represented solely by a circular dot. When the dot is of a known value in size, it can also be used for range estimation purposes, assuming the shooter has some knowledge of the size of his target. Some 'scope makers combine the dot reticle with a conventional crosswire reticle.

double action

Double action that type of firing action whereby a single squeeze of the trigger both cocks and fires the weapon. It is employed in revolvers and old types of rifles and shotguns. It contrasts with single action which requires the hammer to be cocked by hand prior to firing by a squeeze of the trigger. See "single action."

Double barrel a firearm having two barrels; generally used in referring to side by side twin barrelled

shotguns but could also appropriately refer to any two-barrelled gun, regardless of barrel positions, such as an over & under gun.

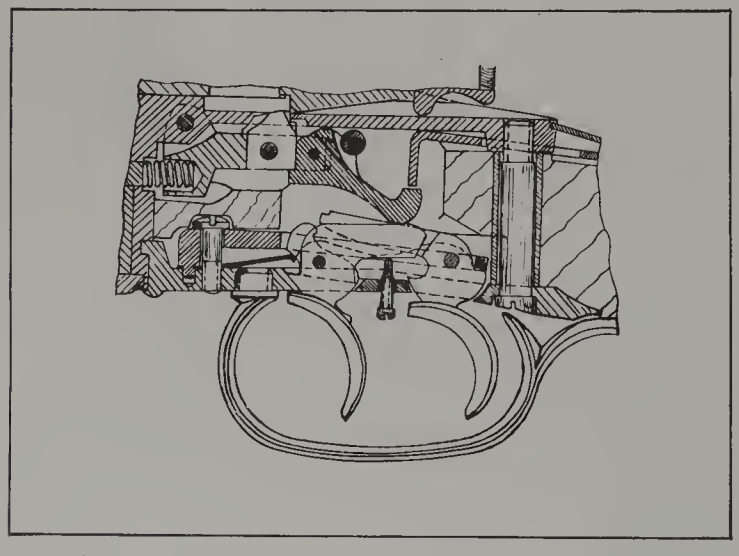
Double base powder produced by dissolving nitrocellulose (gun-cotton) in nitroglycerin and forming the resulting colloid into granules, flakes or cylinders. Also called nitroglycerin powder. Used as a propellent powder. It derives its name from the use of both nitrocellulose and nitroglycerin. Single base powder has only nitrocellulose as its base.

Double, doubles 1. in target shooting two bullet holes that overlap and appear to be but one bullet hole. 2. in trap or skeet shooting, when two targets are thrown simultaneously. 3. a malfunction in a double barrel or over and under gun that results in both barrels firing at precisely the same time. See "doubling."

Double loading in the case of muzzleloaders, it is the mistake of placing a second charge on top of the first charge. In the case of breech loaders, it is the feeding of a round from the magazine when there is a round in the chamber.

Double pull trigger so called because the design requires slack to be taken up in squeezing the trigger before the firing stage is reached. Used mainly on military rifles for reasons of safety.

Double recoil 1. is produced when both barrels of a double barrelled shotgun are fired simultaneously. 2. normally a single shot produces two recoils in succession. The first is the initial recoil that occurs before the bullet or shot charge leaves the gun and moves the gun very slightly to the rear. The second occurs just after the bullet or shot charge leaves the muzzle and produces the violent effect on the shooter.



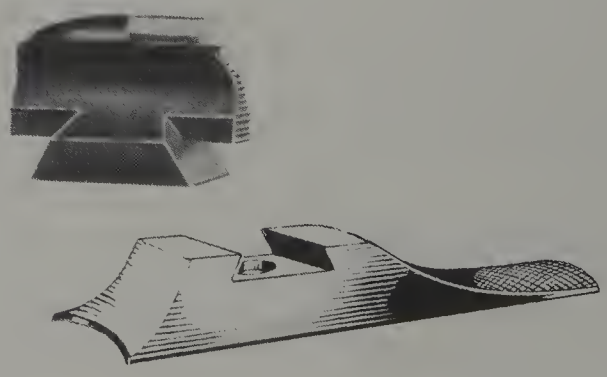
double set trigger

Double set trigger two triggers mounted together in such a fashion that pressure on one trigger will so engage the sear that a slight touch on the second trigger will fire the gun. This is a trigger system that has long been popular in Europe and has just recently started to gain acceptance in the U.S. Double set triggers are ideally suited to shooting at moving targets where precisely timed trigger let-off is essential. Generally, the rear trigger is the "setting trigger", and the front trigger the "firing trigger."

Double triggers 1. the double *set* triggers of a rifle (positioned one behind the other) which employs the rear trigger only as a "setting" trigger to cock the spring mechanism of the forward trigger for an ultra-light trigger pull. With a rifle so equipped, only the forward trigger fires the cartridge and, when the forward trigger is employed without setting, the rifle may be fired by pulling the forward trigger alone though the weight of pull will prove somewhat heavier than normal. 2. the double triggers of a side-by-side double barrel or over & under shotgun whose action is designed so that the forwardmost trigger fires the open-choked barrel and the rear trigger, the tighter choked second barrel.

Doubling a term applied in shotgun shooting when inadvertently the shooter pulls the trigger a second time immediately after the first shot or simultaneously pulls both triggers of a double barrel gun equipped with two triggers. Also applicable in the case of a semiautomatic weapon that fires two or more shots with only one continuing pressure on the trigger, a condition arising when the disconnector fails to function properly.

Doughnut pattern a shotgun pattern distributed around a hole in its center, usually caused by the overshot wad of a roll-crimped shell interfering with the dispersion of the shot column. Roll crimped shotshells are now almost entirely phased out of production.



dovetail

Dovetail a milled, tapered slot cut into metal to facilitate the fastening of a second member. For example, the dovetail slot found at the muzzle of some rifles, into which the front sight is anchored.

Dowel a pin fitting into a matching hole in an abutting piece to prevent motion or slipping.

Downwind the direction toward which the wind is blowing, the leeward.

Drag the resistance offered by air to movement of an object through it. Rarely used in describing air resistance to the flight of a projectile.

Dragoon an obsolete word for a short musket, sometimes spelled "dragon." More popularly used as a name for a cavalryman armed with a short musket.

Drams equivalent an expression that is used to equate the ballistics of a certain charge of smokeless powder to a certain weighed charge of black powder. Before smokeless powder came into being, shotgun shells were loaded with black powder. At that time, manufacturers developed a system for labelling boxes of shells to show the weight of the powder charge together with the weight and size of the shot charge. Thus, a box marked "3¼-1⅛-8" would contain shells loaded with 3¼ drams of black powder and 1⅛ ounces of lead shot, size 8. In spite of the fact that black powder is now obsolete, this labelling procedure is still employed because shotgunners use it to determine the effectiveness of a particular shell. Today, shotshells are loaded with smokeless powder and boxes are marked to show what a given smokeless charge is EQUIVALENT TO in the old dram rating. It must be remembered that smokeless powder is measured in GRAINS and that a very small amount is equal to a much heavier charge of black powder. To load a shell with 3¼ drams of smokeless powder could prove disastrous.

Draw to pull a handgun from its holster.

Draw mark a straight scratch running lengthwise on a cartridge case caused by a foreign substance in the drawing dies.

Dreyse, Johann Nickolaus von, (DRY zeh) (1787-1867) a German gunmaker and inventor who developed the famous Dreyse Needle Gun.

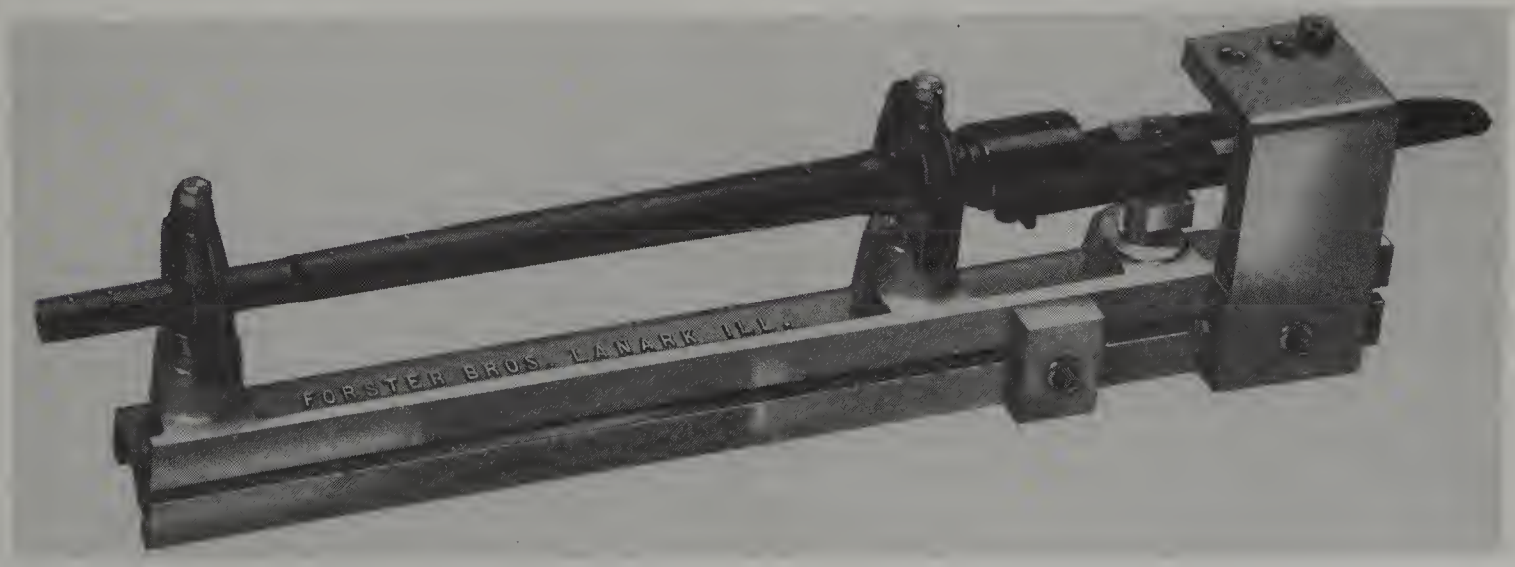
Dreyse needle gun (DRY zeh) a single shot percussion lock rifle having a breech loading action called the "slide system" but actually by today's standards a bolt system. Developed by Nicholas Dreyse, its bolt contained a long needle that, when activated, penetrated the paper cartridge, passed through the propellent powder, and detonated the primer which was attached to the base of the bullet. In 1840 the .607 caliber Dreyse, called the Zundnadelgewehr was adopted by the Prussian Army. Its successor models remained standards in that army until after the Franco-Prussian War.

Drift the amount of shift of a projectile to one side or the other due to its rotation in flight or air resistance. If the bore of a rifle is rifled with a right hand twist, the drift is slightly to the right. If rifled with a left hand twist, the drift is slightly to the left.

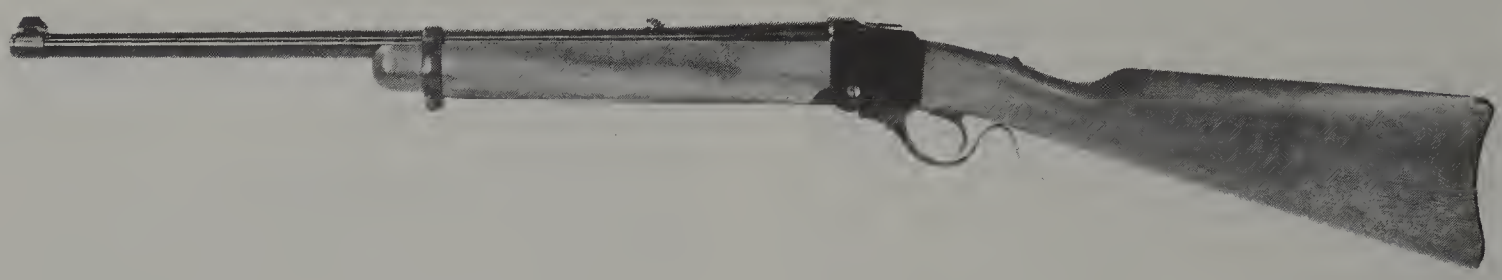
Drift slide the movable piece within the frame of a leaf sight that is pierced and notched to constitute the rear sight of a rifle and which, when raised to a position opposite the desired range gradation on the scale of the sight, moves not only upward but slightly sideward to compensate for drift at such range.

Drill ammunition dummy ammunition used in practice and in drill.

Drilling a three-barrelled gun popular in Europe in which a combination of smoothbore and rifled barrels is used. The most common form of Drilling gun is made with two shotgun barrels of 16 gauge over a sin-



drilling jig



dropping block

gle rifle barrel of 8MM caliber. The rifle barrel is positioned directly beneath the connecting rib of the shot barrels.

Drilling jig a tool used by gunsmiths to locate the holes to be drilled and tapped in a firearm for the purpose of installing a sight or scope mount.

Drill press of the bench or floor type, basically consists of a motor, base, movable head and an adjustable table. It is used for drilling or sanding wood and other materials, for inletting rifle and shotgun stocks, drilling receivers for micrometer sights and a number of other operations required in gunsmithing.

Drills, carbide tipped machinist's high speed drill bits equipped with carbide tips to facilitate drilling in hardened steel.

Driving fit is a fit obtained by driving one part, such as a shaft, into another part having a hole or opening, to retain them in fixed position relative to each other. See "forced fit" "shrinking fit."

Drop otherwise known as the bend of the stock — is the distance from an imaginary line extending along the top surface of the barrel to points over the top surface of the buttstock. The distance between this line and the foremost edge of the stockcomb is called "drop at comb." The distance from this line to the rearmost top edge of the stock (the heel) is called "drop at heel." These dimensions vary according to the use for which a given firearm is intended and (in custom-made firearms) to the dimensions of the shooter.

Drop forging the shaping of metal by a falling hammer which forces heated metal into a die.

Drop of bullet the vertical distance a bullet has fallen under the influence of gravity, during its flight. At any point in its path of flight it is the distance from that point to the line of departure, i.e., the imaginary line that is the continuation of the axis of the bore the instant the gun is fired.

Dropped a slang term referring to missed targets, or points lost, in shooting competitions.

Dropping block a breechblock hinged at its rear so that it may be pivoted downward by means of a lever beneath the small of the stock to expose the chamber, thus permitting the manual insertion of a fresh cartridge.

Drop shot lead shot pellets made by pouring molten lead through a sieve so that droplets fall from a height of approximately one to two hundred feet into a water-filled catch basin. The three or four sizes of shot produced from a single sieve are then subsequently segregated by screening. Also called soft shot. See "shot manufacture."

Drop test a test devised by the Bureau of Alcohol, Tobacco and Firearms to determine the relative safety of handguns and applied to a point system established for the marketability of pistols and revolvers.

Dross, drossing the scum that forms on molten metal is called dross and is caused by oxidation of the metal when exposed to air. It is encountered when casting bullets of lead and lead alloys. It is held to a minimum by casting at the lowest possible temperature. Dross can also be minimized through timely fluxing of the molten alloy.

Drum a cylindrical magazine containing cartridges and adapted to feed certain types of weapons.

Dry firing practice by aiming, cocking, and squeezing the trigger of an unloaded firearm.

DT abbreviation for double trigger.

Duckfoot pistol a multibarrelled pistol having barrels that radiate outwardly from the grip area; an oddity bearing some resemblance to the toes of a duck's foot. Horizontally arranged, the barrels generally fire simultaneously to deliver the widest possible dispersion to shot or ball. According to legend, this form of pistol was created for a ship's captain who feared a mutiny.

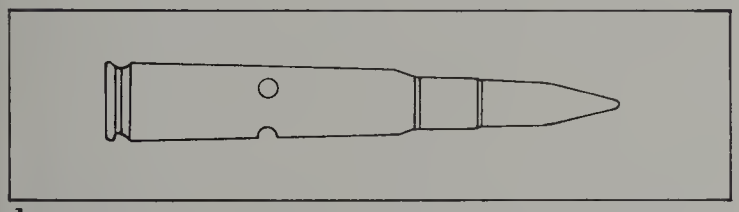
Dud a projectile that has failed to explode, when referring to bombs or artillery projectiles. When applied to small arms ammunition, it refers to a round

that refuses to fire from the firearm due to lack of ignition.

Dueling in a formal manner, a combat between two antagonists fought with deadly weapons, by agreement, and under prescribed conditions and in the presence of witnesses. In the United States, the first state to prohibit dueling by law was Tennessee, on November 10, 1801.

Dueling pistol a pistol generally flintlock or percussion sold in matched pairs, designed to be reliable in action and accurate at ranges up to 30 yards. Pistols of this type were introduced between 1770 and 1780.

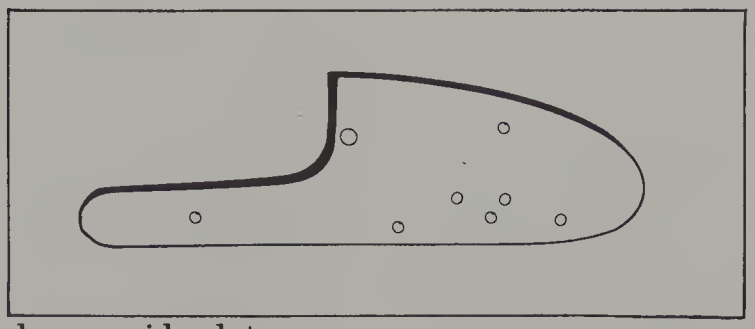
Dum dum a term generally applied to a soft nose or expanding bullet. It is reputed that the name is derived from the British arsenal at Dum Dum, India, where, during the British campaigns in India in the final years of the 19th century, full jacketed .303 Lee-Enfield bullets were made expanding by grinding off the nose of the bullet jacket.



dummy

Dummy a shell or cartridge having no primer or explosive charge. A shortened term for "dummy ammunition."

Dummy ammunition ammunition without an explosive charge used in training and practice and to function-test magazines and feeding mechanisms. The case has holes, grooves or other means to readily distinguish it by touch, from loaded rounds.



dummy side plate

Dummy side plate blank side plates fitted to a box lock shotgun to give the appearance of the more desirable side lock action.

Dunnite See "explosive D."

Duplex cartridge a round having two bullets seated, one behind the other, in a single cartridge case. The U.S. Army M198 Duplex Cartridge, 7.62 mm, contains two 83-grain, copper plated steel bullets of conventional design except that the first bullet contains a cavity in its base into which the nose of the second bullet is nested and the second bullet has a sloping base and provides for dispersion. As used in the M14 rifle, the first bullet has a muzzle velocity of 2800 fps, and the second bullet, with a muzzle velocity of about 2600 fps, has a slightly lower trajectory, thus improving the probability of hits.

Dusted target a clay target which reveals only a puff of dust when hit and which is scored as a miss.

Dust shot very small sizes of lead shot, approximately size twelve, generally employed in making shot cartridges for small calibers such as the .22 long rifle.

Dynamite an explosive highly sensitive to shock but less powerful than TNT (trinitrotoluene). Basically it is nitroglycerin absorbed in porous earth. Invented by Alfred Nobel of Sweden in 1866.

E

Ear muffs the ear muff is comparable to the protection worn by workers in noisy industry, and consists of two ear-covering cups joined by a spring-like loop that is positioned over the top of the head in the fashion of the radio headsets worn by pilots.

Ear plugs substances or devices inserted in the ears to mute sound. Ranging from common cotton tufts and manufactured rubber plugs to elaborate mechanical valve devices, ear plugs are used by shooters to deaden harsh shooting noises — particularly when shooting in confined places.

Ears See "clip guides."

Ebony a black African wood that is frequently used for decorative purposes in the manufacture of high grade gunstocks. Ebony has an extremely hard and dense grain. It is difficult to work with but unusually attractive when professionally shaped and finished.

E.C. blank fire orange or pink explosive powder resembling coarse sand, used as a charge in blank cartridges, small arms and as a bursting charge in hand grenades. Also called "blank fire powder" or "E.C. smokeless powder."

Eccentric describes something not having a common center, thus being descriptive of something not concentric. Mechanical parts are so made and arranged to provide other than a true circular path when turned on their axis.

E.C. smokeless powder See "E.C. blank fire."

Effective range a relative term which may refer to the maximum distance at which accuracy of fire may be expected or the distance at which some intended purpose will be accomplished.

Eject to throw out; the function performed in a firearm by an ejector to expel empty casings. While an empty case usually is thrown out within 90° of the axis of the bore, in some instances empty cases have been thrown back as much as 180° from the axis of the bore.

Ejector 1. the mechanism in small arms and rapid fire guns which automatically throws out an empty cartridge case or unfired cartridge from the breech. It should not be confused with the extractor which merely pulls the empty cartridge case or unfired cartridge from the chamber. 2. (automatic and selective automatic): terms applied to the shell removing devices in break-open type guns, of which the side-by-side and over and under shotguns are the most classic examples. Automatic ejectors expell the shells from both barrels when the gun is opened, regardless of whether either or both have actually been fired. Selective automatic ejectors expel only the fired, empty casings when the gun is opened. The device in double guns that only partially removes the casings is not an ejector but an extractor.

Ejector rod the ejector actuating push-rod, located under the barrel (or barrels) that is fastened to the ejector at the chamber end and which engages the swiveling forend-iron at the other.

Elastic limit the amount of stress placed upon a material that will deform it to just such degree that the material will not return to its original shape or dimensions. This limit is below that of the tensile strength of a material. Thus, while a gun steel might have a tensile strength of 90,000 pounds per square inch, its elastic limit might be in the neighborhood of 50,000 pounds per square inch.

Electric bedder See "bedding control."

Electric ignition, electric gun for small arms, was experimented with as early as the latter part of the 19th century. One type carried a battery to be carried in the pocket of the shooter and connected by wires to the gun.

Electric soldering consists in clamping together the pieces to be joined and after passing a heavy electric current through them, applying solder to the joint where it will melt and flow in and around the joint. It differs from resistance welding in that the metal of the pieces is not melted and therefore does not flow together.

Electric welding See "welding."

Electro-etching is accomplished by the use of the electro-plating process and relies upon the fact that only from exposed metal surfaces on the anode will metal be removed, and only on exposed metal surfaces of the cathode will it be deposited. By coating either anode or cathode with wax, varnish or other material unaffected by the electrolyte and then making designs on them as desired, the removal or deposit of metal can be directed from and to the surfaces as desired. See "electroplating."

Electrolysis corrosion of metal in the earth or structures due to stray currents of electricity passing through them and in effect, conducting a slow acting "deplating" process.

Electrolyte a conducting medium in which the flow of electricity is accomplished by the movement of matter. The liquids in a storage battery and in an electroplating bath are electrolytes.

Electronic sights a comparatively new sighting system made with a combination of electro-optical elements, some of which use ambient light while others are battery-powered. Eliminates the need to align

metallic sights and is often employed on handguns as well as rifles, particularly by older shooters.

Electroplating consists in making electrolytic deposits of one metal upon another by suspending both in an electrolyte and passing an electric current from the plating metal to the metal to be plated. Cadmium, chromium, copper, nickel and zinc have been used in varying degrees as coatings. Color plating is also accomplished by this basic process.

Element in chemistry it is a substance that cannot be separated from itself by ordinary chemical means. For example, aluminum, copper, iron, lead, nickel and zinc are elements, while brass, bronze and steel are not.

Elephant rifle a term applied to any rifle suited for hunting elephants and not to one of particular make, weight or caliber. Formerly old black powder English rifles were often referred to (using the "gauge" measuring system) as 4, 8 or 10 bore elephant rifles, which in inches were respectively .935, .835, and .775 inches in diameter.

Elevate to raise the muzzle of a gun to increase the angle of elevation.

Elevation See "angle of elevation."

Elevation knob the rotatable knob built into the adjusting mechanism of an iron sight or telescopic sight and which is used to raise or lower the elevation setting of the instrument. Generally made with click stops and reference scale.

Elevation table a tabulation of ranges with corresponding elevation settings to be applied to a gun.

Elgin cutlass pistol a single shot percussion pistol with a pointed cutting blade attached to the underside of the barrel, so the weapon could be used both as a firearm and a cutlass. Patented in 1837 by George Elgin of the United States. The U.S. Navy purchased some about that time, but it failed to sell commercially and soon faded from the scene.

Emboss to decorate by raising the surface to form designs, patterns, etc. A form of art formerly extensively employed on both barrels and stocks of sporting firearms. See "checkering" as a form of embossing. See "engrave" as the opposite of "emboss."

Emery an abrasive found in nature as an impure form of aluminum oxide, the constituent that gives it sufficient hardness to cut metals. At one time all grinding wheels were made of emery, but artificial abrasives with superior qualities are now used.

Empirical something that is based solely on experience, observation or experiment and not in reliance upon scientific principles.

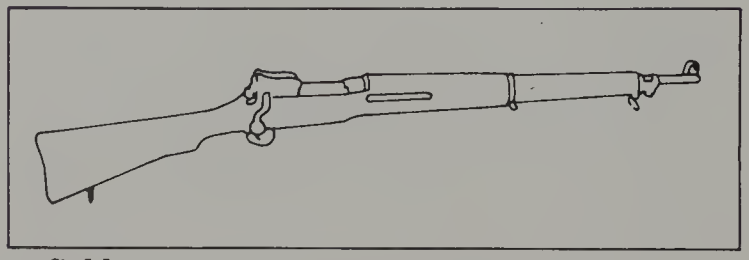
Emplace to fix a gun in a prepared position from which it may be fired. A term common to artillery pieces.

En bloc clip (ON BLOCK CLIP) a clip designed to be inserted together with its load of cartridges into the magazine of certain rifles such as the Garand.

Energy, foot pounds energy is the capacity to do work and in the English system of measurement is expressed in foot pounds. The energy of a bullet in flight may be determined for any range by use of the formula

$$E = \frac{WV^2}{32{,}174}$$

where W is the weight of the bullet in grains and V is the velocity in feet per second.



enfield

Enfield the name associated with numerous military rifle and carbine models produced by the Royal Enfield Manufactory of Great Britain from 1853 on, and to a .38 caliber, six chambered revolver, the official arm of the British Army from 1936 to 1957.

Enfield, American name in popular use for the U.S. rifle, caliber .30, Model 1917. It is a bolt type, breech loading 6 shot magazine rifle, being a modification of the British Enfield to permit use of the U.S. standard rimless cartridge, as in the Springfield, with a regular U.S. service 5 cartridge clip for loading the magazine. By such modification, it permitted the use of production facilities that had been engaged by the British in the United States, prior to the latter's entry into World War I. The Pattern 14 Enfield, originally produced for the British, was made in .303 caliber.

Enfield rifling rifling having square cornered grooves and lands, generally four or six grooves in number. Most modern United States manufactured rifles use this type. A five groove, left-twist rifling of such shape was adopted in 1895 for the British .303 Lee-Enfield rifle.

Engine turning the practice of decorating a steel surface by polishing it with overlapping circular patterns. In engine turning, the subject material is placed in an indexable jig on the work surface of a drill press. An abrasive-impregnated rubber bit is then placed in the drill chuck and brought into contact with the work until a circular pattern results. The work is then indexed in such a way that each sub-

sequent application of the polishing bit will overlap the preceding pattern.

English forend a term describing the small, slim wooden forend common to lightweight English double guns.

English lock a firing mechanism that made its appearance in the first quarter of the 17th century. It was an improvement on the Snaphaunce in that it made the battery and pan cover in a single hinged piece, so that striking the battery not only produced a spark but caused the pan cover to rise to expose the priming powder in the pan. In addition, it added to the Snaphaunce a half cock position. A further improvement became known as a dog lock.

English stock (also known as straight grip stock) a type of shotgun stock, common to double barrel guns, for which English gun makers are famous. Designed to keep overall gun weight to the minimum, this style of stock is made with a very straight, slim hand grip.

engraving, acid etched

engrave

Engrave to cut designs, patterns or identifying marks in a metal surface. Used for decorative or identification purposes in firearms, and accomplished by means of a small hammer and chisel. Designs in wood are more properly termed "carvings." When metal decorations are accomplished by chemical means they are "etchings" and when applied by pressure they are "roll engravings." Term is also used to describe the markings left on a bullet by the rifling.

Engraving, acid etched a process for decorating steel that employs a method comparable to photo-engraving: the surface to be decorated is coated with a wax-like material and then exposed to a high-intensity arc light focussed through a film of the desired pattern. The wax is thus melted away in those areas and subsequent immersion in a strong acid solution will etch the design into the surface of the metal.

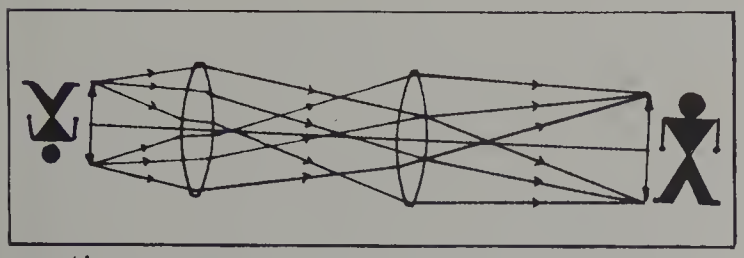
Envelope the British term for a bullet jacket.

Epoxy 1. a chemical prefix denoting the presence of oxygen attached to two different atoms of a chain. 2. shortened popular term for "epoxy resin," which is a polyether resin of recent development. Its excellent chemical resistance and adhesive qualities make it an ideal finishing agent for gunstocks as well as an excellent adhesive for many varied substances including wood and metal.

Equivalents length, volume, capacity, weight, pressure, velocity, and U.S.-Foreign cartridge equivalents are found in the Appendix.

Erecting system the lens assembly in an optical instrument that inverts the upside-down image taken by the objective lens so that it will appear right-side-up to the viewer at the eyepiece.

Erma a 9mm German machine pistol used in World War II by German police and SS, and to some extent by the French. The name is also used as a trademark

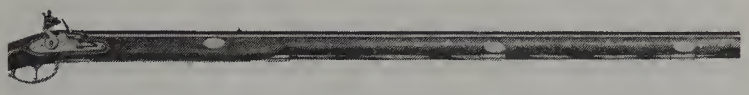


erecting system

for small arms sold commercially.

Erosion the wear on the bore of a gun caused by the action of the hot gases of the exploded propellent powder on the surface of the metal.

Error the distance by which a shot misses the target.



escutcheon

Escutcheon the part of a weapon, usually metal, on which the name, trademark or other distinguishing feature of the manufacturer is displayed.

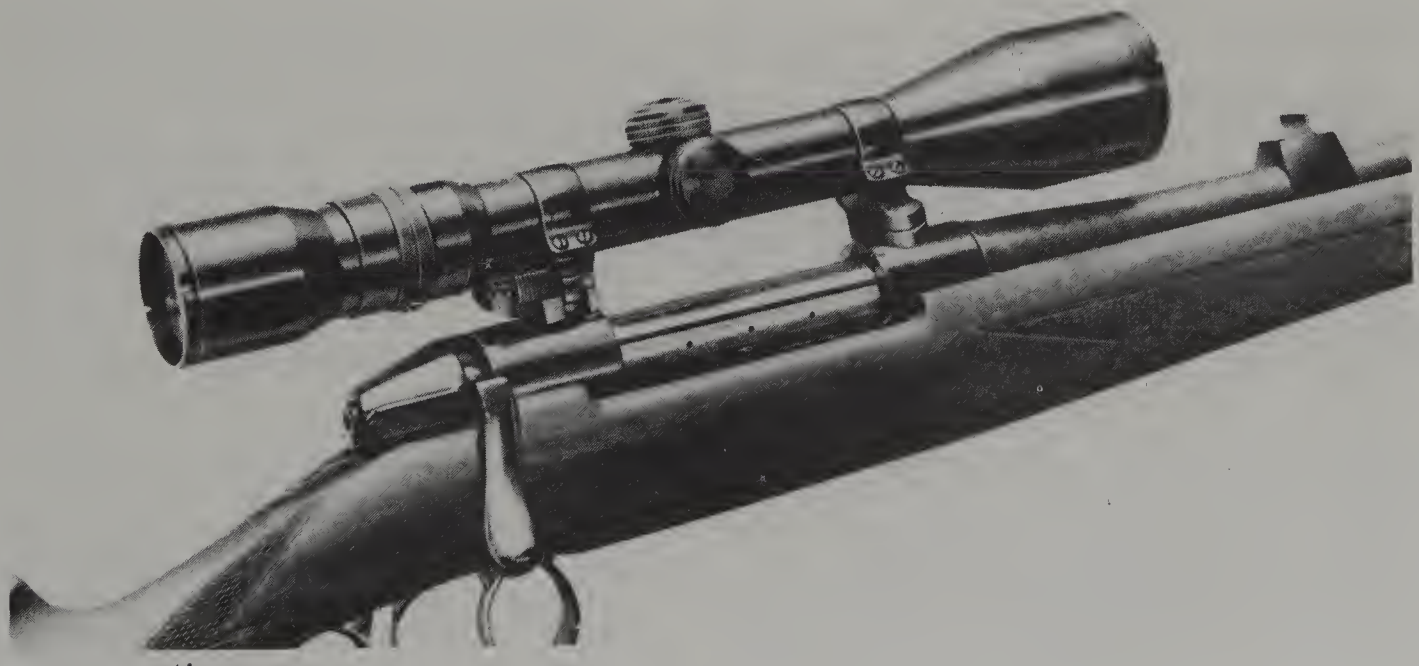
Espignolle a muzzleloader repeater that achieved repeated fire by loading bullets and powder charges atop each other. After the foremost charge fired, a powder train in a longitudinal groove of the next bullet transmitted ignition to its powder charge, and so on. The principle was known as far back as 1580 and used to some extent until about 1870.

Espringle an ancient mechanical launcher of the mechanical type which hurled a spear-like bolt of the type known as a "garrot" or "carreau."

Etch to engrave by causing the lines of the design or pattern to be eaten away from the surface of a metal by treatment with acid. Used to decorate or identify firearms on their metal surfaces. Acids found to work satisfactorily are, — for iron and steel: full strength hydrochloric acid, brass: nitric acid, copper: mix of 2 parts nitric and 1 part sulphuric acid, lead: nitric acid, aluminum: 10 percent solution of caustic soda or potash. Various substances including paraffin are used to provide resistance to an acid when etching. The substance used must provide a thin "resist" that will cling to the metal, prevent under cutting by the acid and enable fine lines to be drawn through it without tearing or crumbling.

European mounting the European rifleman does not handle rifles or shotguns the way an American does. He stands upright and shoots with his head erect — only the lower part of the cheek and the jaw embrace the comb of the stock. For this reason, the European gunsmith mounts scopes higher and closer to the comb than an American gunsmith. Thus, an American shooter can have problems when using European equipment. It is always important to maintain proper eye-relief when using European scope-sighted firearms.

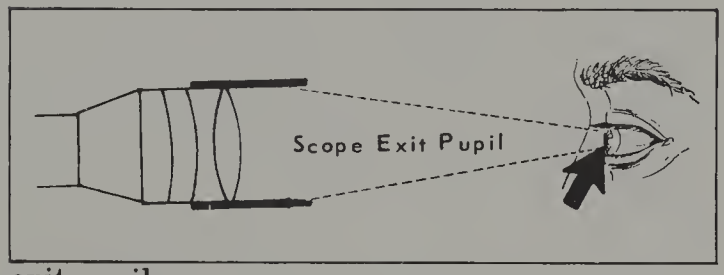
European walnut wood from the English walnut tree which is commonly found throughout Europe. The terms Circassion walnut, French walnut, Italian



european mounting

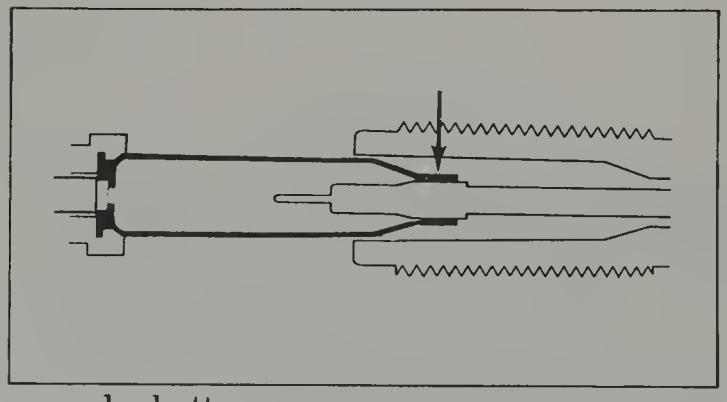
walnut, etc., are misleading since all these, incidentally, originated in China. The differences in the coloring and graining of walnut are caused by varying growth conditions. European walnut is a fine stockmaker's wood because it is hard, densely grained, and very durable.

Evening gun in the military service, the firing of a gun as a signal for the lowering of the national emblem at retreat. It is fired after the sounding of the last note of the bugle call at retreat. Also called "retreat gun."



exit pupil

Exit pupil the bright spot of light from the eyepiece of a telescope made by the emerging pencil of light when the telescope is pointed toward light and held a short distance in front of the observer's eye. It is the point at which an optical instrument focusses its light rays and it is the point at which the viewer positions his eye.


expander button

Expander button a device that sizes the inside diameter of a cartridge case neck to a dimension slightly smaller than that of the bullet for which the case is intended. Usually this may be found mounted on the inner stem of a modern sizing die.

Expanding point any bullet made with a point that is designed to expand upon impact. An exposed lead tip, split tip, flat tip or hollow tip bullet may be called an "expanding point" bullet.

Expansion 1. the increase in the dimensions of a substance when heated. Expansion of a solid body in length is termed linear expansion; expansion in volume, volumetric expansion. 2. the overall enlargement of a cartridge case as the result of having been fired. See "coefficient of expansion."

Expert 1. in the United States military service, the highest classification given for skill in the use of small arms. It is also the name given to the individual who holds such classification. Next in order are the classifications "Sharpshooter" and "Marksman." 2. In civilian terms (set by the National Rifle Association), "Expert" is the second highest classification for a shooter. In diminishing order, the NRA sequence is "Master," "Expert," "Sharpshooter" and "Marksman."

Explode to cause to burst noisily and violently.

Explosion a violent bursting caused by the sudden production of great gas pressure, a very rapid or almost instantaneous combustion. Instantaneous explosion is called "detonation." Slower explosion is called "deflagration."

Explosive any chemical compound or mixture which burns so rapidly that an explosion results. A high explosive is used as a bursting charge in bombs or projectiles; a low explosive is used as a propelling charge in guns.

Explosive D ammonium picrate, a high explosive charge relatively stable in handling and transporting, used as a burster in armor-piercing projectiles. Also called dunnite.

Explosive train the arrangement of explosives in an explosive device whereby an initial fire from a primer is transmitted and intensified and the final step is the setting off of the train charge.

Express cartridge a much abused term which probably stemmed from turn-of-the-century English gun makers who wished to call attention to the high speed (velocity) attainable with their firearms and ammunition. At one time the term connotated a light, faster than average bullet, but it has also been applied to slower, heavy bullets striking with unusual impact energy. Today, makers tend to favor the term "magnum."

Express rifle a term formerly applied to a rifle with a long range and relatively flat trajectory.

Exterior ballistics the study of the flight of projectiles after they leave the muzzle of a gun.

Exterior ballistic table a table that for a specific type of gun and projectile gives data on the flight of the projectile after it leaves the muzzle of the gun.

Extractor a device for withdrawing an empty car-

tridge case or an unfired cartridge from the chamber of a gun. In certain types of automatic weapons it withdraws a cartridge from the feed belt. See "ejector."

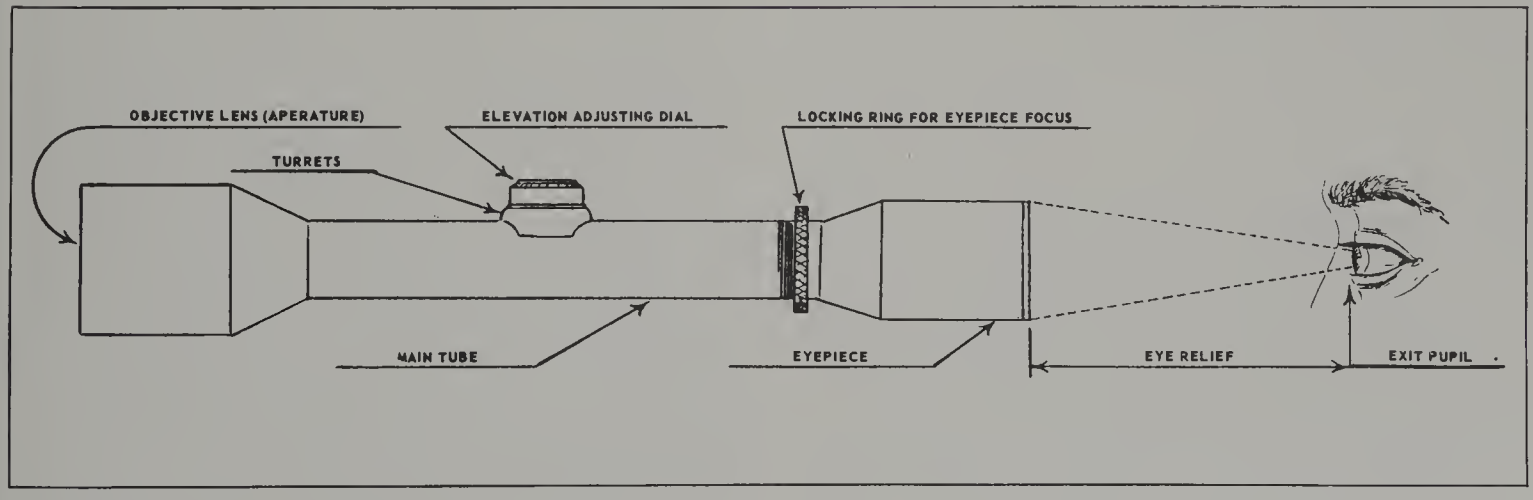
Extreme range the greatest distance a gun will shoot. In the case of small arms, a weapon held upward at an angle of about 30° when fired will produce its extreme range. If there were no air to offer resistance, an angle of 45° would produce the extreme range.

Extrude, extrusion to force out, such as in forming plastic fibers or in forming the spaghetti-like cords of smokeless powder, which are cut into suitable lengths to make powder grains. Metals are also formed by heating and extruding through dies under high pressure. Lead bullets may be made in such a manner.

Eyepiece the lens or lenses nearest to the eye of the viewer looking through a telescope, microscope, binoculars or other optical instrument.

Eye-relief the distance from the eyepiece end of a telescopic sight to the location of the exit pupil. The point at which the exit pupil is focused is where the shooter's eye is normally positioned. While eye-relief is relatively unimportant to scopes intended for .22 caliber rifles, it becomes critical to scopes destined for use on high caliber weapons. If eye-relief is inadequate, scope-mounted weapons having long recoil can cause serious injury to a shooter. Generally, scopes for .22 caliber rifles should have eye-reliefs of about 2 inches. Scopes intended for use on medium to large calibers should never have eye-reliefs of less than 3 inches and, preferably, 4 to 5 inches when intended for use on rifles of the heavier calibers. See "exit pupil."

eyepiece



eye-relief

F

Fabrique Nationale d'Armes de Guerre the famous association of Belgian gunmakers located in Herstal, Liege, Belgium. Its letters "FN" identify many of its products and models. Better known to Americans as the manufacturers of certain firearms sold in the U.S. under the name "Browning."

Face of breech the rear surface of the chamber or barrel that contacts the bolt or breechblock.

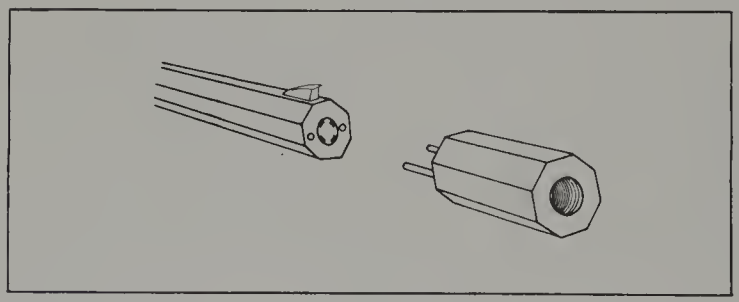
Factor of safety extra strength built into a firearm beyond that required for normally expected loads.

Fahrenheit the name of the thermometer on which the scale reads 32 degrees at the freezing point of water and 212 degrees at the boiling point of water, with each degree being 1/180 of that temperature range. The Fahrenheit thermometer is most commonly used by the English speaking people of the world. The abbreviation for Fahrenheit is F.

Falcon, falconet French cannon of the 16th century. The falcon was the larger, weighing approximately 600 to 700 pounds. The falconet was about 200 pounds lighter.

Falling block a type of single shot rifle action designed with a vertically moving breech block. The block is operated by a lever which is often incorporated in the trigger guard and which extends from the underside of the action. When the lever is actuated, the breech block slides down into the receiver well, exposing the chamber of the barrel.

Fall off the disengagement of the sear with the hammer notch that occurs through the action of force, other than the normal one produced by squeezing the trigger, such as vibration, shock, etc.



false muzzle

False muzzle a loading accessory common to muzzleloading guns. At one time, barrels for high grade muzzleloaders were made overly long so that a portion of each barrel (about one to three inches in length) would be left over when the barrel was cut to finished size. These short lengths, each fitted with two or more small pins located to coincide with holes drilled into the barrel muzzle, were then taper-reamed in the bore. Perfectly mated to a given barrel, the false muzzle would facilitate the loading of a solid lead ball and would prevent damage to the rifling at its most critical point — the muzzle. It was removed after each loading and replaced for each succeeding loading.

False ogive a streamlined cover or windshield covering the nose of a projectile to reduce its resistance to the air in its flight.

Fanning the hammer a rapid fire method of firing a single action revolver which consists in holding the gun in one hand with the trigger held back, tied back or removed entirely, and the hammer slapped or fanned back with the lower part of the palm of the other hand. A technique that is not only extremely dangerous but one that also tends to damage the firearm.

Fast Draw the sport of drawing a single-action revolver from a belt holster in a race against time. Only blank shells or primed, empty casings loaded with wax bullets are permitted in Fast Draw competition. (Use of live ammunition is strictly forbidden). Several forms of Fast Draw competition are regularly practiced: 1. Standing Reaction Event — upon a given signal the competitor draws and fires while a split-second timing device records his reaction time. 2. Walk & Draw Event — two competitors simultaneously walk a prescribed path toward inanimate targets, drawing and firing upon a given signal. In this event wax bullets are used in primed but powderless cases, so that accuracy may be considered as well as speed. 3. Balloon Events — variation of "Standing Reaction" and "Walk and Draw" events in which balloons are employed as targets. Fast Draw rules strictly specify the type of equipment that may be used in competition. While there is no national Fast Draw organization, a number of regional associations are currently in operation; these include: The Texas State FD Assoc., Western States FD Assoc., and Mid-West FD Assoc.

Fast Draw Timer a timing device that measures reaction time in 100ths of a second. Chrondek Electronics, Inc., 2125 "D" Street, LaVerne, California is one of several manufacturers of such devices.

Fast pull a target released before the skeet or trap

shooter calls for it. Though not required to accept such a target, the shooter will be scored if he fires at it.

Fast swing starting to aim behind a moving target and then swinging up behind it and overtaking it until the proper lead is reached and then firing.

Fatigue a condition that sometimes occurs in parts that are subject to repeated shocks and stresses, causing rupture of the part.

Federal Firearms Act became effective July 30, 1938 and was directed toward the control of all firearms, and of pistol and revolver ammunition in interstate and foreign commerce, requiring the licensing of manufacturers and dealers in those goods. It was repealed on December 15, 1968, having been replaced by the "Omnibus Crime Control and Safe Streets Act of 1968", enacted June 19, 1968.

Federal Firearms License a license issued under the Federal Firearms Act or, since December 16, 1968, one issued under the Gun Control Act of 1968, that authorizes a person to engage in the business of importing, manufacturing or dealing in firearms or ammunition in conformity with the law.

Feed 1. the movement of ammunition to a gun. 2. the mechanism by which ammunition is fed to a gun.

Feed belt See "ammunition belt."

Feed guides means for guiding cartridges as, for example, the lips at the top of a magazine to guide a cartridge into the chamber and the shaped surfaces within the receiver above the magazine well to guide a cartridge into the chamber as it leaves the magazine.

Feeding the operation of successively passing cartridges by mechanical means from the magazine of a gun into its chamber.

Feed mechanism a device on an automatic or self-loading weapon that furnishes fresh cartridges or shells as fast as the used ones are ejected.

Feet per second a term used in the English system of measurement to express velocity or speed of a projectile. Abbreviated as FPS, fps, f.p.s., ft/sec or fs.

Ferguson, Patrick (1744-1780) a Scotsman, firearms enthusiast and a British officer, who was killed at the battle of Kings Mountain while serving His Majesty in the American Revolutionary War. He developed and, in 1776, patented an improved breech loading rifle which became the first breech loader used by the military.

Ferlach a town in Austria, the home of a number of gunmakers, most being members of the Ferlach guild. When Dutch gunmakers settled in Ferlach in the 16th century, the manufacture of firearms was begun there. Military arms formerly were the principal products but now 2-barrel, 3-barrel and 4-barrel combination rifles and shotguns, and double and single barrelled rifles hold that distinction.

Ferrule a short bushing or tube.

Fiddleback maple a form of maple that was often used by early American gunmakers simply because of economy and availability but which, today, is sought by some because of the attractive striations of the grain. The name stems from the fact that this wood was also employed by violin-makers for the back panels of violins.

Field of fire the area effectively covered by the fire of a weapon.

Field of view the extent of an area visible through the lens of an optical instrument. For example: a 2½ power rifle scope rated to yield a field of view of forty-three feet will show the viewer an area forty-three feet in diameter at a distance of one-hundred yards. Field increases as distance to the subject increases: rifle scopes, however, are generally rated in accordance with performance at 100 yards. There is a relationship between magnification and field of view in instruments of comparable size — the higher the magnification, the smaller will be the field of view.

Field piece a field artillery gun or howitzer.

Field strip to take apart the major assemblies of a gun for cleaning or minor repairs.

Fine sight aiming of a gun, or the adjustment of the sight of a gun, so only the tip or top edge of the front sight is seen through the rear sight. This is in contrast with a full sight or a coarse sight.

Finish 1. the final step in completing the appearance of the exterior surface of a firearm. 2. the coating placed on the exterior surface of a firearm. Examples of finishes for metal parts are blueing or browning.

Fire to shoot or discharge a gun.

Fire adjustment improving the accuracy of fire by moving the gun in elevation and/or windage, or, in the case of an explosive projectile, to regulate the time of its explosion.

Firearm any weapon from which a projectile is discharged by explosive means. Definitions with respect to legal obligations and liabilities vary with the laws covering this subject. While all sizes of such weapons fall under this definition, it is the rifle, shotgun, handgun and other weapon of size conveniently carried by a man that is popularly referred to as a firearm. Its predecessor was a flame throwing tube used long before powder was used to hurl a projectile.

Firearm combinations almost from the time a firearm came into use, the ingenuity of man contrived to combine a firearm with almost anything. Examples are: swords, cutlasses, daggers, maces, shields, brass knuckles, whips, canes, knives, umbrellas and belt buckles. Today most are museum pieces.

Firearm laws Federal laws that apply to firearms in

the interstate and foreign commerce of the United States are found in the: National Firearms Act of 1934 as amended, Omnibus Crime Control and Safe Streets Act of 1968 as amended. Gun Control Act of 1968, and Mutual Security Act of 1954 as amended. The many laws adopted by the States and their subdivisions are found collected in "Published Ordinances-Firearms" prepared by the U.S. Treasury Department as required by the Gun Control Act and which will be updated annually. Mailing of firearms is subject to Postal Regulations authorized by law.

Firearms principles, early applications of begins with the compounding of gunpowder, believed to have occurred early in the 13th century. Its early use to hurl a projectile out of a tube began the series of improvements in guns, propellents, projectiles and other features that eventually attained the degree of perfection known in modern times. That hundreds of years were required to accomplish this was not due to lack of ingenuity on the part of man — it was lack of suitable materials, metal working tools and precision measuring instruments. Examples of early anticipation of some modern features are found in crude but workable: multi-barrelled cannon, 14th century; front and rear sights on matchlock, 1475; rifling, 1498; interchangeable barrels, early 16th century; repeaters, early 16th century; 3 barrel matchlock, early 16th century; single action lock (pressure), 1521; paper cartridges, 1575; revolver, snaphaunce, 1650; automatic pistol, 1664; 6 chambered revolver, hand turned & locked, 1770; breechloaders, 1730; grenade launcher (flintlock), 1760 and 7 barrel successive fire, 1790.

Fire at will command to fire independently of others on the firing line — comparable to saying, "fire when ready."

Fired case the fired (spent) hull of a rifle, pistol or shotshell cartridge.

Fire-forming the process of changing the shape of a cartridge case in order to increase its powder capacity, by firing it in a gun having a larger chamber. In fire-forming to create wildcat cases from conventional factory brass, two dimensions must be constant between old and new: these are head-diameter and headspace length. Only the taper, shoulder and neck areas can be safely altered by fire-forming. In forming, the case is loaded with a light charge and fitted with a bullet mated to the new barrel bore. Upon firing, this case will be "blown out" (expanded) to assume the dimensions of the new chamber size. Often two or more firings are necessary to attain desired finished size. Fire-forming should only be attempted by experienced reloaders using tried and proven fire-forming data.

Fire hole the British term for flash hole.

Firelock sometimes used in referring to a matchlock. In Great Britain it means a flintlock.

Fire position the location of an individual or gun from which the gun is fired. Also called firing position. Posture of the body is referred to as "prone position", "offhand position," etc.

Firing elevation the vertical angle at which a gun is held or set for firing with respect to the horizontal.

Firing line in target practice the line along which the shooters are placed for firing at the target.

Firing mechanism those parts of a gun that cooperate to cause the propelling charge to fire. Also called the "gun lock" or just the "lock."

Firing pin that part of the firing mechanism of a gun, basically a plunger, that is adapted to strike the primer and thus cause the propelling charge to fire.

Firing point the place from which a gun is fired.

Firing range the distance from the gun to the target.

Firing squad 1. a military detachment designated to fire three volleys of blank cartridges at the burial of a person accorded military honors. 2. a detachment of riflemen designated to carry out a sentence of death by shooting.

Firing table a tabulation or chart which furnishes all of the necessary data for accurately firing a gun under standard conditions, together with the corrections required to meet special conditions such as wind, etc.

Fish scale checkering a comparatively new form of handgrip decoration that is carved into gunstocks in place of traditional checkering. Particularly popular in Europe at this writing, this form of "carving" resembles a fish-scale pattern.

Fishtail wind a wind that is constantly changing direction back and forth.

Fixed ammunition a round of ammunition assembled as one unit, that is, cartridge case, primer, propellent powder and projectile, and so loaded into a gun. "Separate-loading" ammunition is placed in a gun in parts and is utilized in cannon of large calibers.

Fixed round See "fixed ammunition."

Fixed target a stationary target.

Flame staining the practice of enhancing a plain stock by scorching its surface with a blowtorch, thereby creating irregular lines which resemble natural figuring.

Flammable has the same meaning as inflammable, i.e., capable of being easily ignited. Its use is preferred to inflammable because of the possible ambiguity of the prefix "in" which as a prefix technically means "not" or "non."

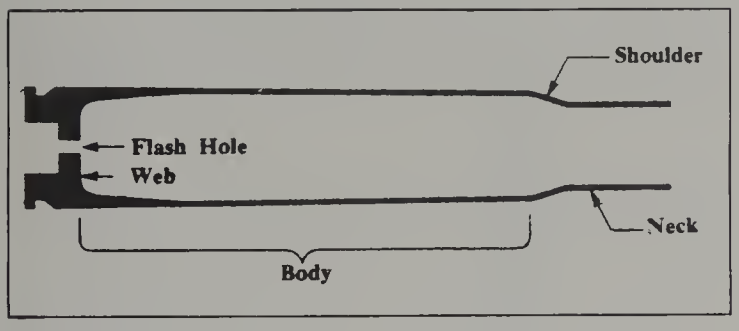
Flareback a burst of flame from the breech of a gun.

It is caused by gases that remain in the barrel and when the breech is opened, pass to the rear where they ignite when mixed with air.

Flare pistol a pistol for discharging a flame for signalling or illuminating purposes.

flash hider

Flash hider a muzzle attachment for a gun to conceal the flame when it is fired at night.



flash hole

Flash hole the hole in the primer pocket of a cartridge case through which the primer flash passes to ignite the propellant charge. Also employed in muzzleloading circles to refer to the flame transmission hole which gives access to the bore from the pan. Prior to the flintlock era, this was known as a "touchhole."

Flash in the pan the flash produced in the pan of a flintlock by igniting the small powder charge in the pan with the sparks produced by the flint striking the the steel frizzen. The flash, if it passed through the touchhole, ignited the propellent powder charge in the bore. Failure to do so resulted only in a pyrotechnic display without results, giving rise to the use of the expression for other unsuccessful efforts.

Flashless-nonhygroscopic powder smokeless powder that does not readily absorb or hold moisture and does not produce a flash upon explosion. Used mainly as a propelling charge for projectiles.

Flash pan See "pan."

Flash point with respect to oils is the lowest temperature at which the vapor produced by heating the oil will flash up without setting the oil on fire. The fire or burning point is the lowest temperature at which the oil will burn. The flash points of mineral lubricating oils, with few exceptions, lie between 300 and 600 degrees Fahrenheit. Heating to the flash point decomposes the oil as a lubricant; heating to the burning point causes the risk of fire.

flash pan

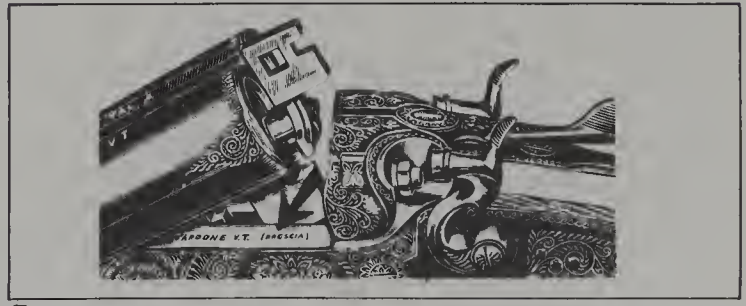
Flash suppressant See "flash hider."

Flask a small flattened container with a narrow neck used to carry powder or shot for muzzleloading firearms. Invariably made from a non-sparking material such as copper, leather or bone, and often equipped with a form of measuring spout.

Flat fire another term for "flat trajectory fire."

Flat nose bullet a bullet whose shape is characterized by having a flattened end instead of a rounded nose, i.e., it curves from its maximum diameter to a flat end instead of a rounded end or point. Commonly employed in cartridges intended for tubular magazine rifles.

Flats common to double barrel shotguns and most weapons having barrels that swivel about a hinge pin. The "flats" are the broad, flat surfaces that project forward from the face of the breech and that engage corresponding flats on the underside of the barrels, in the vicinity of the lugs, when the barrels are locked in firing position.



flats

Flat trajectory a trajectory with little vertical curvature. This is a characteristic of projectiles with a high muzzle velocity fired from long guns and of projectiles fired at short ranges.

Flat trajectory fire fire at such a range or elevation setting that the projectile in flight describes a path that is almost flat, rather than curved. Also termed "flat fire."

Flat trajectory weapon a gun firing projectiles at such velocity that the path is almost flat rather than curved. At battle ranges, a machine gun and a rifle are such weapons.

Fleeting target a target that is exposed for so short a time that deliberate aim is difficult.

Fleschette (FLAY shet) a small dart with a fluted shaft or a vane, adapted to be dropped from an aircraft or propelled by an explosive.

Flexible gun gun on a movable mount that permits it to swing in all directions.

Flight the act of flying, such as the flight of a projectile from gun to target.

Flinch the involuntary movement of a shooter at the instant of firing, causing the weapon to be jerked from its aimed position.

Flint an extremely hard stone, of the quartz family, usually gray, brown or black in color, that produces sparks when struck against steel. Used in flintlocks to produce the ignition required to set off the priming powder.

Flintlock a firearm ignition system, the highest state of development of a system that ignited priming powder by striking a spark. It is credited to Marin le Bourgeoys of France around the year 1615. The anvil is a hinged steel pan cover which, when struck a glancing blow by the cock, not only produces sparks but rises to expose the priming powder in the pan causing it to ignite. Other features gave it advantages not possessed by the snaphaunce. The flintlock reigned supreme for 200 years. In 1690, it became the official British arm, called the Brown Bess because of the color of the barrel.

Flintlock arms many arms using the flintlock system were developed beginning in 1615. Various features of modern arms were found in them, such as sights, multi-barrels, revolving barrels and cylinders, repeating fire and even breechloading. During the first part of the 19th century the flintlock era came to a close.

Floating barrel a rifle barrel that is not contact-bedded to the stock but left to float freely, as opposed to a barrel that is closely fitted to the stock and pressure-bedded at the forend. A controversy exists among target shooters over which of the two methods is most conducive to accuracy.

Flobert, Nicolas (1819-1894) noted French gunmaker who shaped a percussion cap to give it a rim, provided it with a lead bullet, and used only the priming mixture as a propellent. The present day BB Cap is almost identical to it. Flobert produced an early rim fire cartridge in 1847 and is credited with being the first to initiate its development.

Floorplate that portion of a self-contained box magazine, in a rifle, that acts as a base plate for the follower spring.

Fluted comb the decorative concave channel cut into the leading edge of the comb on a rifle or shotgun stock, generally on both sides.

Fluted forend a foregrip made with concave channels to accommodate the fingertips.

Flux a substance used to clean and prevent the oxidation of surfaces to be joined by soldering, brazing or welding. Examples are powdered resin for soldering tin, muriatic-acid for zinc surfaces, borax for brazing, sal-ammoniac (ammonium chloride) for steel, iron, gun metal, copper and brass.

Flying firing pin a firing pin shorter than the length of its travel in the breechblock, a coil spring holding it away from the primer until the falling hammer drives it against the force of the spring and onto the primer.

FMJ in referring to a bullet, it is the abbreviation for "full metal jacketed."

F.M.P., FMP the abbreviations for a full metal patched bullet.

flintlock

FN abbreviation for The Fabrique Nationale d'Armes de Guerre, an association of Belgian firearms manufacturers.

FNH powder abbreviation for "flashless-nonhygroscopic powder."

Focal length the point some distance behind an optical lens at which parallel light rays passing through the lens are converged and focussed.

Focal ratio the number obtained by dividing the focal length of a lens by its aperture. In this way, the "strength" of a given lens is ascertained: the lower the focal ratio, the stronger the lens.

Folded crimp See "star crimp."

Folding gun a type of hinged gun (usually a single barrel) that permits the barrel to swing in an arc approximately 180° so that it folds snugly against the stock portion for easy transportability. The term "folding gun" has been used somewhat erroneously in recent years in referring to conventional break-open type side-by-side and over & under guns. These types "fold" open in arcs at about 30° to 40° and are not true folding guns.

Folding sight a hinged open rear sight that is used in the upright position but which may be folded down, out of the way, so as not to interfere with a mounted scope or "peep" sight. Generally intended for use only as an auxiliary sight.

Folding trigger 1. a hinged trigger that when folded forward lies close to the under side of the frame. Commonly found in antique pocket pistols and "hideaway" guns. 2. in some fine quality large bore weapons, having two barrels and double triggers, the forward trigger is often hinged so that it folds forward. This is done when heavy recoil is anticipated to prevent bruising of the trigger finger when the rear trigger is pulled.

Follower a spring loaded metal plate in a clip or mag-

follower

azine that presses upward against the cartridges resting upon it to urge them into alignment, at the proper angle, with the chamber of the firearm.

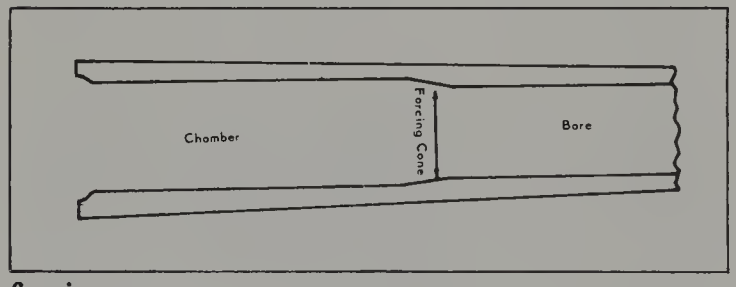
Foot-pound a unit of measure of work. It is the work required to raise one pound a height of one foot, where the accelerator of gravity is equal to 32.174 ft/sec/sec 33,000 foot pounds is equal to one horsepower.

Foot-pounds of energy a British system of measurement used in the U.S. for measuring the amount of work or energy stored up in a moving projectile. A foot-pound is the work or energy required to lift one pound to a height of one foot. Or more appropriately, it is the work that can be done by a one pound weight when dropped from a height of one foot. The foot-pounds of energy developed by a bullet are determined by multiplying one-half the square of the velocity in feet-per-second by the mass of the bullet.

Force any cause tending to produce or modify motion; strength that causes the acceleration of the movement of material bodies. Thus, the force of the explosion of a propellent powder imparts motion to a projectile.

Forced fit also known as pressed fit, applied to a shaft, pin or other cylindrical part that is forced under considerable pressure into a hole of slightly smaller diameter. A forced fit has a larger allowance than a driving fit and requires greater pressure. See "driving fit" and shrinkage fit."

Forcement the term applied by ballisticians to the force required to move a bullet through the bullet seat and the leade into the rifling of the barrel when the gun is fired.



forcing cone

Forcing cone a cone formed in a shotgun barrel between the chamber and bore to ease the passage of the shot from the shell into the bore.

Forearm the heat insulating material of wood or plastic beneath the rear portion of the barrel of a rifle or shotgun to afford a means for grasping it and to protect the shooter from the heat of the barrel.

Forend tip the foremost end of a forend (or forearm), towards the muzzle. Generally used only in referring to a decorative forend tip which differs in composition from the wood of the basic forend.

Forensic ballistics the science of ballistics as it relates to crime, specifically the identification of firearms. In the 1920's, scientific methods were first applied to the identification of firearms used in the commission of crimes. Colonel Calvin Goddard coined the term and publicized it.

Foresight See "front sight."

Forge to form or shape generally in the manufacture of firearms by heating and hammering.

Forge welding See "welding."

Forsyth, Rev. Alexander John (1768-1843) a Scottish Presbyterian minister, with an interest in chemistry, mechanics and shooting, who developed the fulminate of mercury composition from which stemmed the percussion caps, pellets and primers that later proved so successful. It was in 1805 that he began to develop the first percussion lock. In 1807, he finished his design of what came to be known as his scent bottle lock because its magazine was shaped like a scent bottle, replacing the priming pan. He first began experimenting with detonating compositions in 1793.

Fouling the residue of the gases and scrapings from a projectile remaining in the bore of a gun after firing. The gas residue is called "powder fouling" and the scrapings from the projectile are called "metal fouling." The latter is rare with modern copper or gilding metal jacketed bullets.

Fouling shot a preliminary shot from a firearm to carry away oil or other removable, non-obstructing matter from the bore of the gun.

Four-ten gauge really not a gauge at all since .410" is the bore diameter of the barrel. Called ".410 gauge" because it is grouped with shotguns and used with shotshells. Because of its small size, the ".410" is considered the most difficult of the "gauges" used in skeet shooting.

Fowling the hunting of wild fowl.

Fowling piece (archaic) a shotgun used to hunt wild fowl.

Fox the trade name for assorted double barrel shotguns manufactured by the Savage Arms Corporation of Westfield, Massachusetts.

FPS, fps, fs, ft/sec abbreviation for feet per second, the term by which in the English system of measurement the velocity of a projectile is expressed.

Fragmentation the breaking and flying in all directions of the pieces of a projectile, grenade or bomb.

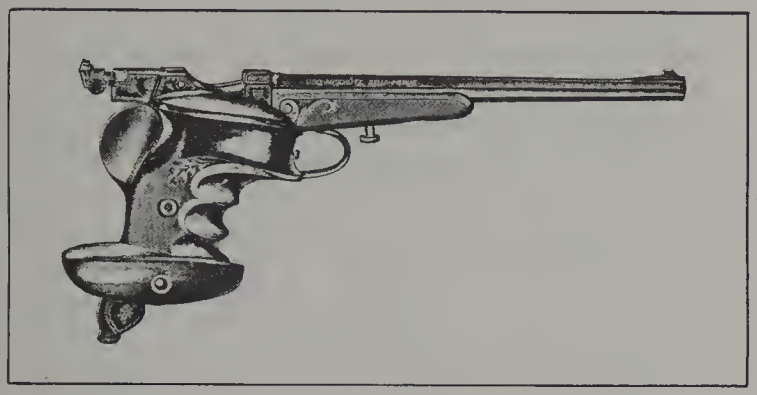
Frame the basic structure and principal component of a firearm.

Franchi the trademark for firearms manufactured by the firm of Luigi Franchi s.p.a. of Brescia, Italy.

Frankford Arsenal a U.S. Army manufacturing arsenal established near Philadelphia, Pennsylvania by Act of Congress in 1815, the first land being pur-

chased for its use in 1816. It became the technical and production center for small arms ammunition, artillery ammunition components, fire control and related instruments.

Free-bore a form of "leade" or "throat" cut with parallel walls instead of tapered walls. See "leade" and "throat."



free pistol

Free pistol a .22 calibre target pistol having minimum established requirements to qualify for use in International Shooting Union (ISU) and some NRA competitions.

Free rifle a type of target rifle used in International shooting, the word "free" signifying a minimum of restrictions as to weight, stock, etc.

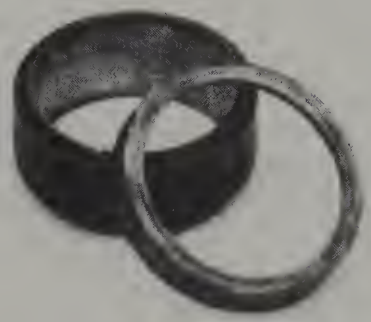
french checkering

French checkering a pattern of checkering for stocks in which, at regular intervals, lines are omitted. Also called skip-line checkering.

French polish a finishing technique for gunstocks that results in a very high gloss (although somewhat fragile) finish. The basic French polish formula consists of boiled linseed oil, shellac and alcohol. A cotton tuft is first moistened in alcohol and then wrapped inside a piece of lint-free cloth to form a ball. The finisher then alternately dips this into the linseed oil and shellac, rubbing the mixture onto the surface of the wood in smooth circular motions.

Freshening-out the restoration of a worn or rough bore of a barrel to good condition by slightly deepening the grooves and smoothing the tops of the lands.

Friction the resistance of the movement of one body with respect to another body with which it is in contact. Thus, there is resistance to the passage of a bullet through the bore of a gun causing some wear.



friction rings

Friction rings the bronze and steel rings used on a recoil-operated semi-automatic shotgun to retard the recoil action of the barrel. These rings are adjusted according to the type of shotshell employed: generally, bevels are mated when using high-velocity loads and unmated for standard velocity loads. It is likewise important that the outer surface of the magazine tube upon which the friction rings are mounted is maintained so that it is clean, smooth, and virtually dry.

Frieze (freeze) a decorative border for a checkered, carved or engraved pattern.

Frizzen the upright portion of the flintlock firing mechanism consisting of a steel or iron plate against which the flint strikes to produce the sparks for igniting the charge. See "battery."

Frizzen pick a short pointed metal pick carried as an accessory and used to clean out clogged flash holes of flintlocks or primer holes of percussion type firearms. In the latter case they were termed nipple picks.

Frizzen spring a heavy leaf spring that is employed for the purpose of holding the frizzen (striker) in firing position so that it can resist the thrust of the flint-carrying hammer on a flintlock. This resistance is carefully adjusted by the gunmaker to result in maximum sparking action over the flashpan.

Frog the double-toothed metal hook used on a rifle sling to permit adjustment for length.

Frog mount the popular European type of detachable scope mount consisting of scope rings equipped with twin hooks which engage recessed bases.

Front loading the term applied to early percussion revolvers because they were loaded into the chambers of the cylinder from the front.

Front sight a fixed or detachable, and sometimes adjustable, projection above the barrel near its muzzle that when placed in line with the target, the rear sight and the shooter's eye establishes the line of sight from the gun to the target. Also called "foresight" or "muzzle sight."

Front strap that part of the frame of a pistol or revolver that forms the front of the grip, the backstrap forming the rear of the grip. The grips of some assault rifles, sub-machine guns and machine guns also have grip straps.

Fugee a corruption of the term "fusil." See "fusil."

Full automatic an automatic weapon that gives continuous fire as long as the trigger is held back.

Full jacketed refers to a lead or lead alloy bullet that, except for its base, is completely encased by a thin wall of harder metal. See"metal cased bullet."

Full length sizing the practice of restoring a cartridge case to its original dimensions. In reloading, the fired, expanded case is forced into a die that restores it to original factory size. Full length sizing is particularly important to shooters who load for semi-automatic, lever action or slide action firearms.

Full metal patched technically a bullet having a metal jacket that covers the base where it is crimped over the core.

Full patch a now archaic term for a fully jacketed bullet, a term that probably traces its origin to the muzzleloading era.

Full service round a complete round with the maximum military service charge. Each smaller charge counts as a certain percentage of a full service round.

Full sight aiming a gun with all of the front sight seen through the rear sight. This is in contrast with a fine sight or a coarse sight.

Fulminate any highly explosive compound that detonates. Fulminate of mercury is an example.

Fulminate of mercury See "mercury fulminate."

Fulminating powder means highly explosive powder but usually refers to a mercuric fulminate powder.

Fume, fumes smoke or vapor.

Fusee (FEW zee) a friction match or colored flare designed to continue burning in a wind.

Fusil (FEW sill) a light flintlock musket. The word is of French origin meaning steel for striking sparks. This term is used interchangeably with "fusee."

Fuze, fuse a device, mechanical or electrical as part of a projectile, bomb, mine or grenade that causes it to explode at a fixed time or on impact. The word also applies to a train of powder connected to an explosive, that causes ignition when the train of powder is consumed by burning.

G

Gabilondo manufacturer of the "Llama" and "Ruby" lines of automatic pistols and revolvers: Gabilondo y Cia., Vittoria, Spain.

Gage a measuring instrument or device for accurately testing the dimensions of a manufactured object. The advances in the art of making gages made possible the introduction of mass production methods in industry. Mechanical, electrical and air gages are types commonly in use today.

Gage blocks are small blocks of precise dimension in thickness (within a four millionths of an inch) used to check or establish accurate measurements in shops and laboratories. A complete set might total as many as 85 blocks.

Gain twist a type of rifling that increases the number of turns it makes as it curves from the breech end of the bore to the muzzle, instead of having a uniform helical curve throughout. An accelerating form of rifling.

Gallagher the breech loading rifle invented by Mahlon I. Gallagher, characterized by a trigger guard lever that moved the barrel ahead and down for loading with a paper cartridge. It was a contemporary weapon of the Civil War.

Gallagher, Mahlon, J. American inventor of a trigger-guard-lever operated breeching system (1860), which swung the barrel ahead and down for loading. A number were purchased for use by the Federal Government in the Civil War. Also patented in 1857, a self priming gunlock.

Gallery an enclosed or partially enclosed range for target practice with small arms.

Gallery gun aside from the small caliber firearm, air or gas gun used today in gallery shooting, the name also applies to single-shot firearms once popular in public shooting galleries and in the private salons of France. Some were in large calibers and in many cases firearms and spring-air guns were specially de-

signed as gallery guns. In Germany, the name for a gallery gun is "Zimmerstutzen."

Gallery practice small arms practice in an enclosed or partially enclosed range.

Gallery practice ammunition small caliber ammunition or reduced charge ammunition used in gallery practice.

Gallery practice cartridge a small caliber cartridge or a cartridge with a reduced charge, used in gallery practice.

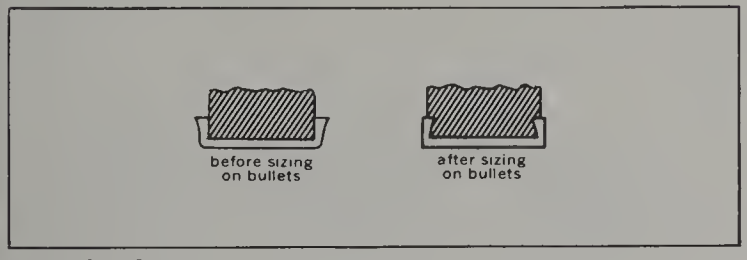
Gallery range an indoor target range generally suitable to .22 calibre firing, usually providing a distance of at least 50-feet between the firing line and targets.

Gang mold a mold form having multiple cavities for forming a number of castings with a single pour.

Garand, John C. (1888–) a Canadian born American citizen who moved to the U.S. at the age of 10 and became an outstanding ordnance engineer. He was best known for his work at Springfield Armory in designing the semiautomatic weapon adopted by the U.S. Army in 1936, officially the cal. 30, M1, but popularly known as the Garand rifle.

Garand rifle The popular name for the U.S. Rifle, Caliber .30 M1, so-called in recognition of its designer, John C. Garand.

Garrot 1. a spear-like "bolt" shown in old illustrations of the firing of a cannon, believed to be the earliest illustration of the use of gun powder (1326 A.D.). Also known as a carreau. 2. an ancient term for the lever used to wind a cross bow.



gas check

Gas check 1. a device in a gun that prevents the escape of gas through the breech, such as the gas escape hole which diverts gas entering the bolt through the striker hole. 2. a cup of copper or other metal on the base of a lead bullet to protect it from hot powder gases.

Gas check bullet a lead bullet designed specifically for use with a gas check.

Gas cutting the rapid erosion caused when the propellent gases escape through small openings, such as corners of the grooves at or shortly beyond the bullet seat, before the bullet has expanded to cut off gas escape. "Erosion" is the term applied when larger areas are worn by gases. Gas cutting is also commonly found under the top strap of revolvers in the area between the cylinder and barrel mouth when the ammunition employed is too powerful or when the throat is too abrupt. (See "erosion.")

Gas cylinder a tube having a piston, connected to the barrel of a gas-operated automatic weapon, whose function is to operate the cartridge extracting and cartridge reloading mechanisms.

Gas filled a term that is sometimes used in referring to gas-filled rifle scopes. Most often nitrogen is used for this purpose and the most commonly used description is "nitrogen-filled." Gas-filling is employed to prevent fogging when the instrument is subjected to radical changes in temperature.

gas gun

Gas gun the term usually applied to guns using liquefied carbon dioxide (CO_2) as a propellent. In 1834, use of such gas was experimented with in a gun by Peder Rasmussen of Denmark. The term applies to guns using other gases (except air) as propellents.

Gas leak See "primer leak."

Gas operated a self-loading firearm that utilizes the expanding force of the propellent powder gases to extract a fired cartridge case and insert a fresh cartridge with gun cocked ready to fire. A small hole or port in the barrel provides the means for a portion of the expanding gases to enter a gas cylinder below the barrel and thus to act on a piston and initiate the several steps required to empty and reload the chamber.

Gas piston the piston-like rod which, powered by the propellent gases that are siphoned from the bore, serves to operate the breech mechanism of the firearm. A device common to automatic and semiautomatic gas-operated weapons.

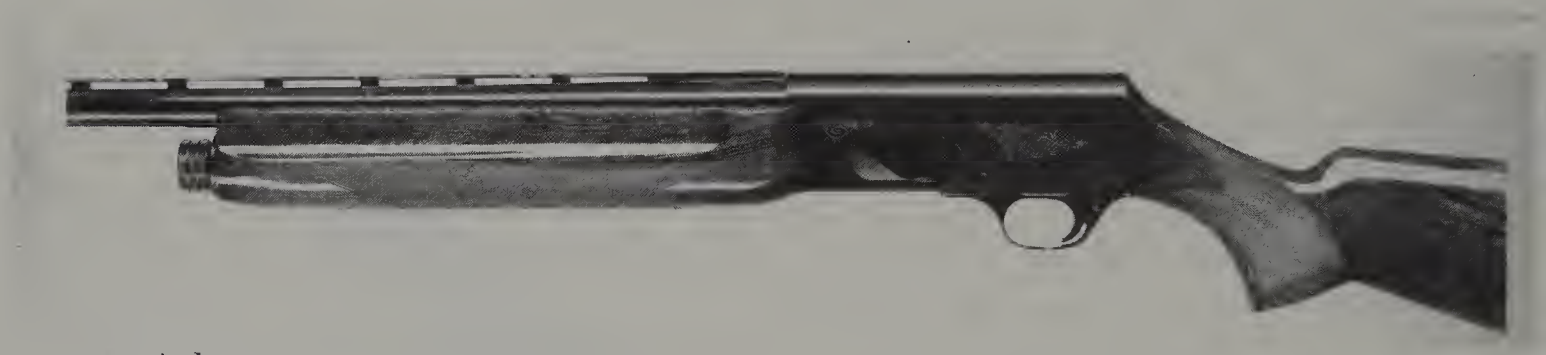
Gas port 1. the small hole in a gas operated rifle that connects the bore with the gas cylinder. 2. a port provided in the wall of a receiver to permit the escape of gas flarebacks harmlessly into the open air. Sometimes called "gas vent."

Gas recoil the rearward pressure exerted by the force of the expanding gases of the exploded propellent powder.

Gas regulator the adjusting feature in a gas operated firearm that retains sufficient gas pressure in the operating mechanism while permitting excess gas to escape.

Gas sealed 1. in riflescopes, a moisture or fog preventing technique that calls for the filling of the instrument with nitrogen gas and meticulous sealing of all openings to prevent the contamination of interior surfaces by exterior atmosphere. 2. a term occasionally employed when referring to the ability of a breech mechanism to contain the gases created by a fired cartridge.

Gas vent 1. the vent holes cut in a rifle receiver in the vicinity of the bolt head. Employed as a safety measure to release excess gas pressures when they are inadvertently developed. 2. the slotted vents in a muzzle brake which are designed to divert gas pressure from behind the projectile as it clears the muzzle. Used in this manner, gas vents tend to reduce recoil and minimize muzzle jump.



gas operated

Gas welding See "welding."

Gat slang for a handgun, adapted from the name "Gatling gun."

Gate an opening into a passage provided with a closure, such as the "loading gate" commonly found on single action revolvers.

Gatling The first successful mechanical machine gun, named after Richard J. Gatling, who patented it in 1862. Initially it was hand driven, later motor driven. Characterized by its mounting of a number of barrels. The barrels were of .58 caliber, rimfire, grouped about a central axis. While it was replaced by the automatic Maxim gun, the multibarrel principle has had modern application.

Gatling, Richard J. (1818–1903) an American Doctor of Medicine, mechanic and inventor. The first design of his multiple barrel gun was patented in 1862, but his improved model patented in 1865 was the one commercially successful.

Gauge a unit of measure: in a shotgun it refers to the diameter of its bore based on the early measuring system, which assigned to the size of the bore the number that was the same as the number of pure lead balls, each of the diameter to fit the bore, that made up one pound in weight. Thus, the 12 gauge bore is based on a lead ball weighing 1/12 of a pound.

Geiger, Leonard an American inventor of the first

true rolling block lock, for which he was granted a U.S. patent in 1863 and which he sold to the Remington Company.

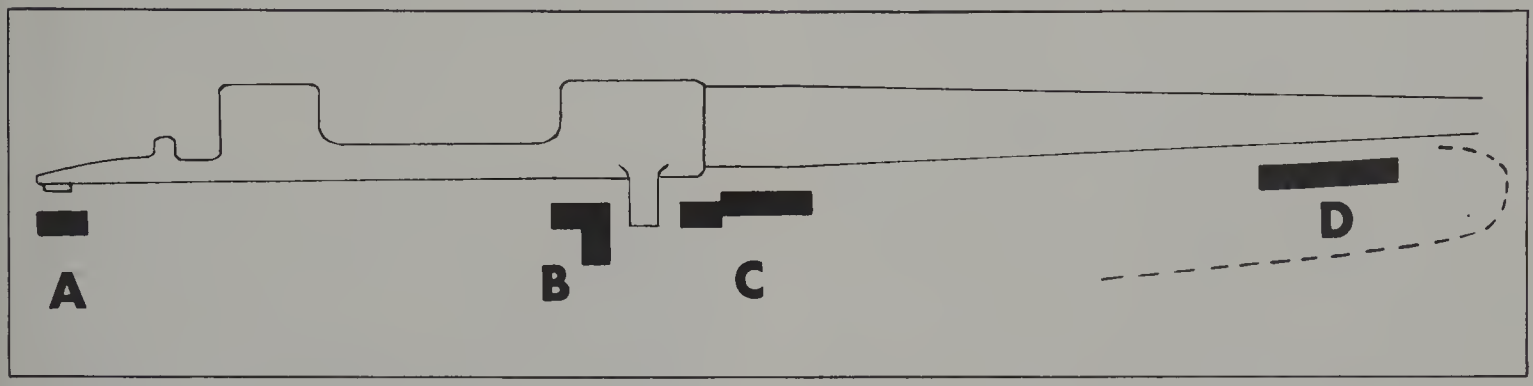
Giant powder an explosive akin to dynamite.

Gilding metal an alloy containing from 90 to 95 percent copper, with the balance of the alloy being zinc; used for bullet jackets. European manufacturers frequently coat their bullet jackets with a thin application of tin to prevent tarnishing.

These are the pressure points for properly inletting a stock or, for applying glass bedding:

A. just a little glass under the rear tang screw surface.
B. under the forward receiver ring . . . (don't forget the rear surface of the recoil lug!)
C. glass a two-to-three inch portion under the barrel at this point (measuring from the recoil lug forward).
D. assuming this point is two inches from the tip of the forend, glass a two-inch section. Glass should start four inches from the forend tip and end two inches from it.

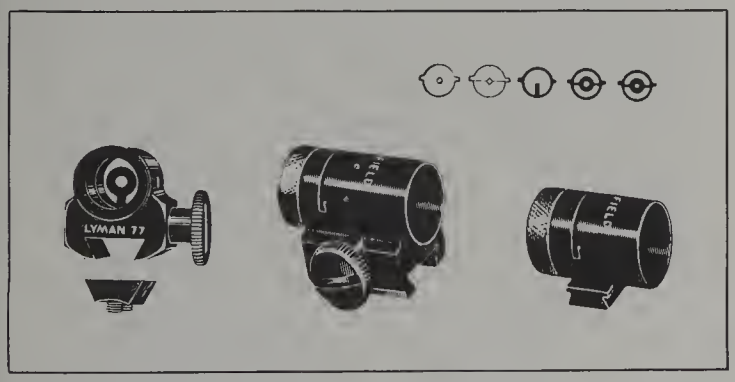
If barrel is to be free-floated, omit glass (or other pressure) at point D.



glass bedding

Glass bedding See "bedding."

Glisenti a seven shot 9mm Italian semiautomatic pistol adopted as official Italian military weapon in 1910 and officially designated "Pistola Automatica Model 1910."



globe sight

Globe sight a type of front sight made for rifles; designed to prevent distorted "sight pictures" by eliminating reflections. In a globe sight, the front sight blade is positoned inside of a hollow tube, the open ends of which are aligned with the receiver sight. Globe sights generally permit the interchanging of a number of assorted sight blade inserts. Generally employed only on target rifles.

Glue a term loosely applied to any number of substances that have adhesive qualities. Good commercially available glues are acceptable for work on gunstocks.

Gonne, gunne the 12th and 13th century forms of spelling "gun".

Go off half cocked the accidental discharge of a miguelet lock, the first to combine the frizzen or battery with the cover of the flash pan. To load the pan, the hammer had to be retracted to engagement with a secondary sear, the half cock position, the cover raised, the pan charged and under light spring pressure, the cover returned to its normal closed position. In this condition the loaded gun could be carried and when it was to be fired, fully cocked before the trigger was squeezed. When a worn or defective secondary sear let the hammer slip off, the gun discharged. It is a common expression since that time to describe someone who speaks or does something before being fully prepared.

Goose gun a shotgun designed specifically for goose shooting at long range (up to sixty yards). Most often made in magnum gauges and equipped with long, full-choked, barrels.

Gouge a form of wood chisel having a concave blade, used by gunmakers in roughing out the concave curve where the barrel of a gun fits into the wood forearm.

Grain 1. a unit of weight, there being 7000 grains in an avoirdupois pound. The weight of a powder charge and the weight of a bullet are expressed in grains. It also has other meanings, such as a descriptive word

for a small hard particle, and frequently is improperly used to describe the granules or pellets of powder. 2. the natural figurations found in wood.

Gram is a metric unit of weight, one thousand of which equal one kilogram. Conversion of grams to the English system of measurement may be made by reference to the Appendix.

Grand the Grand American Trapshooting Tournament annually held at Vandalia, Ohio, usually in late August.

Granulation the size and shape of granules of propellent powder.

Grapeshot a cluster of small iron shot fired from a cannon and intended to spread in flight.

Graphite a mineral essentially of carbon. It clings readily to wood and iron surfaces and is unchanged by heating. Used as a lubricant.

Graphite grease a lubricant containing graphite.

Graticule the English term for "reticle." See "reticle."

Gravity, force of the force exerted by the attraction of the earth. When it acts upon a free falling body it accelerates the speed or velocity of fall at the uniform rate of 32.174 feet per second. Starting with zero velocity at the instant the body is let fall, the velocity at the end of the first second will be 32.174 feet per second, at the end of two seconds 64.348 feet per second. This force acts on a bullet the instant it leaves the muzzle of a gun.

Grease 1. a fatty substance. 2. a thick lubricant used on metal parts of guns in preparation for shipment or storage. A mixture of one part of white petroleum jelly and one part of anhydrous lanolin is recommended as a gun grease for prevention of rust.

Grease gooves the channels or grooves created in the external walls of a lead or cast bullet for the purpose of holding a grease or lubricant.

Grease gun the nickname given to the U.S. M3 and M3A1 submachine gun used in World War II and the Korean War.

Greek fire while many incendiary mixtures were known to have been used in ancient times, even as early as 429 B.C., what is known as Greek fire is said to have been introduced in the 7th century by Callinicus of Heliopolis at Constantinople to set fire to enemy ships. It is believed to have been a mixture containing quicklime, which in contact with water developed heat, and together with materials like sulphur or naptha, caused spontaneous fire.

Greene, James Durrel a Colonel in the U.S. Army. Inventor of a carbine in which a forward trigger was pulled to unlock the barrel to permit it to be twisted to the left and slid forward for loading. It was equipped with the Maynard tape primer. Also later the inventor of an oval bored bolt action rifle, patented in 1857.

Greener crossbolt See "crossbolt."

Greener safety a pivot-type thumb operated safety produced in 1875 by W.W. Greener, an English gunmaker, for use on his shotguns and rifles. Later employed by many European manufacturers.

Greener, William (–1869) an English gunmaker, inventor and author, who in 1835 made a self-expanding rifle bullet that antedated the Minie ball of 1849. He is also well known today as an author, his foremost book being "The Gun" (1835). W. W. Greener, his son and successor in business and writing, published "The Gun and its Development" in 1881, and republished it in its 9th edition in 1910.

Green powder a form of black powder that is found in early production stages and which has not yet been dried nor coated with graphite.

Grenade a miniature bomb thrown by hand or discharged from a rifle and detonated by a fuze. Grenade launchers, in the form of mortars, were known prior to 1600.

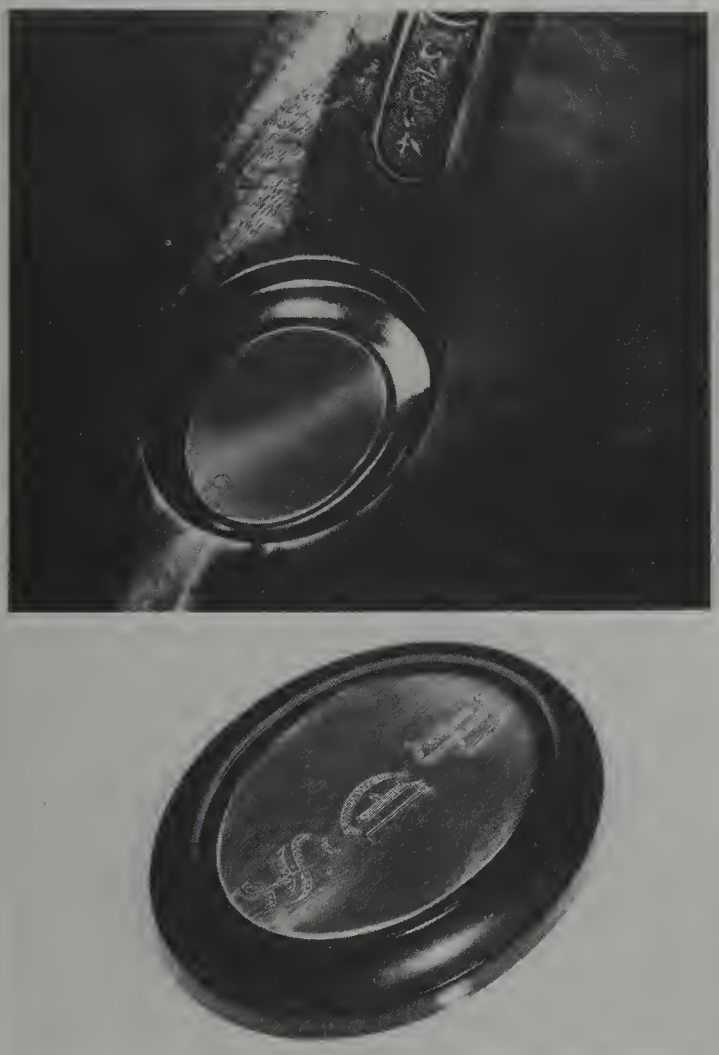
Grinding 1. the removal of material by abrasive means, usually with grinding wheels. 2. the reduction to powder by friction or crushing.

Grip 1. that part of a firearm about which the fingers of the hand may be clasped. On pistols and revolvers,

grip adapter

it is the handle. On rifles and shotguns, the small of the stock immediately behind the breech. The handgun grip has been copied in many hand held devices. 2. the slots cut into the lugs of a double barrel shotgun and which are engaged by the locking bolts when the barrels are secured in a firing attitude. Also called "bites."

Grip adapter a filler placed against the leading surface of a handgun grip to reduce the distance between the grip and the trigger. Adapters are often employed when the shooter finds the factory grip awkward or uncomfortable and, since an adapter will also tend to lower the natural gripping surface, they are used, too, when a shooter tends to grip a handgun too high.



grip cap

Grip cap a cap used on pistol grip stocks of rifles and shotguns to protect the lower surface and edges from chipping. Grip caps may also be used to lengthen and enhance the grip itself and are often made from contrasting materials for decorative purposes.

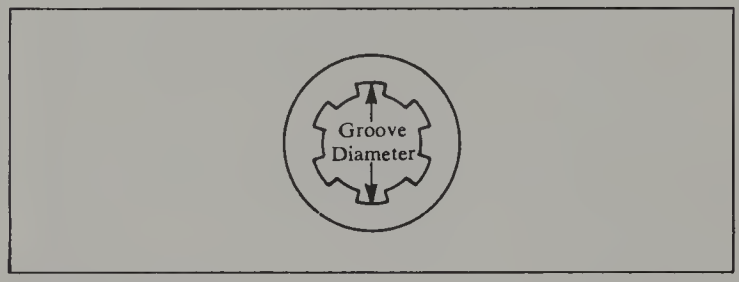
Grip marks insignia or legend on gun grips to indicate manufacturer, usually in the form of an escutcheon.

Grip safety a safety feature found mainly in semiautomatic pistols, incorporated in the grip to prevent the gun from being fired unless the grip is firmly grasped while the trigger is squeezed.

Grip stop an adjustable platform that protrudes from the lower edge of a pistol grip for the purpose of supporting the heel of the hand. Widely used on target pistols and occasionally found on target rifles. Sometimes called "hand shelf" or "heel rest."

Grip straps the front strap and backstrap of a handgun grip. The front strap is the curved metal band-like member comprising the leading edge of the frame; the backstrap is the curved band-like member comprising the rear edge of the frame.

Grommet a device made of rope, plastic, rubber or metal to protect the rotating band of projectiles.



groove diameter

Groove diameter the diameter of a rifled bore measured from the bottom of one groove to the bottom of the opposite groove.

Grooves, groove 1. the shallow channels that run lengthwise and follow a helical curve in the bore of a rifled barrel, which together with the lands that lie between them, give a projectile passing through the bore a spinning motion that stabilizes it in flight. 2. a circumferential channel or cannelure in the cartridge case or projectile. When in a cartridge case, it is the extractor groove to facilitate the removal of the case from the chamber after firing. When in a bullet, it acts as a lubrication groove, a receptacle for metal scraped off in passing through the barrel or as a groove into which the case is crimped to hold the bullet.

Ground stone a pulverized stone, use for lapping, i.e., where a small amount of material is to be removed or a smooth surface is desired.

Group a number of shots fired from a gun by a shooter into a target, usually with one sight setting.

Guard a protective part of a weapon. The trigger guard is a curved metal piece on a firearm surrounding the trigger and serving to protect it and prevent

accidental firing. The hand guard, usually of wood, protects the hand from the heat of the barrel.

Guard ammunition ammunition having a reduced charge to reduce its effective and extreme ranges. Used in the military services for guard purposes.

guard screw

Guard screw one of two or three screws used to secure the trigger guard to the receiver of bolt action firearms.

Gun a weapon discharging a projectile by the force of an explosion, or by compressed air or gas. In the United States, it applies to any type of firearm. In England, in referring to a firearm, it means a shotgun. In early England the spelling was also "gonne" and "gunne."

Gun carriage a mount for a gun by which it may be moved or fired, or both moved and fired.

Gun Control Act of 1968 was enacted on October 22, 1968, effective as of December 16, 1968. It replaces the Federal Firearms Act which was repealed as of December 15, 1968 by the "Omnibus Crime Control and Safe Streets Act of 1968." It extends Government control over the sale, shipment or receipt of firearms and all ammunition in interstate and foreign commerce. The Secretary of the Treasury administers the law and promulgates regulations to implement it.

Guncotton a nitrocellulose having a very high nitrogen content made by treating cotton with nitric and sulphuric acids. It is used in making certain high grade smokeless powders, is used to carry the flame to the burster in some projectiles, and is also used in electric priming devices.

Gun cover a cover of leather, canvas, treated cloth, plastic or other weather resistant material to protect a gun from dirt and the weather.

Gunfight a fight in which the principal weapon is a gun.

Gunfighter a term applied in Western frontier days to one skilled in the use of a gun, especially a handgun, and a veteran of many gun fights.

Gunfire the discharge of cannon or firearms.

Gunflint the flint used in a flintlock firearm.

Gun hand 1. the hand customarily used by a shooter in firing a handgun. 2. a slang expression used in stories of the Old West to denote an individual proficient in the use of a handgun and generally one who was hired because of that skill.

Gun lathe a lathe designed for turning and boring cannon of large size and more frequently called turning and boring lathes.

Gun lock 1. originally used to refer to the ignition systems used on guns of the type that required a flame or spark to ignite the priming powder. In present day use, this term has acquired a broader meaning, one that encompasses all firing mechanisms — specifically referring to that assembly that is comprised of the firing pin, hammer, spring, sear and trigger. 2. the locking system used in sealing the breech of a firearm.

Gunmaker a person, firm or corporation that manufactures firearms.

Gunman 1. usually refers to a person armed with a gun and suspected of using it unlawfully against others. 2. also refers to a person who makes guns, carries a gun, or is expert in the use of a gun.

Gun metal an alloy of the bronze type formerly used in making cannon, dark gray in color, and containing about 90 percent of copper and 10 percent of tin with small percentages of lead, iron and zinc. Sometimes used to describe the dark blue or black finish on the metal surfaces of a gun.

Gun moll a female criminal who carries a gun, or, the female companion of a gangster.

Gun mount a support for a gun, such as carriage, tripod, bipod or other similar gun supporting means.

Gunner 1. a person who practices shooting. 2. a naval warrant officer responsible for ordnance on a vessel.

Gunnery the art of handling guns and being familiar with exterior ballistics and the technical problems involved in firing them.

Gunning the sport of shooting or hunting with guns.

Gunpaper a composition for military use made by treating paper with nitric acid so it is similar to guncotton.

Gunplay the serious exchange of shots from firearms, usually with the intent of wounding or killing.

Gunpoint the aim of a gun; at gunpoint meaning in the line of sight of a gun and in close proximity to it.

Gunpowder the term generally applied to black powder. Oldest recorded use as a propellent 1313 A.D.

Gun rack See "arms rack."

Gun room a room in which guns are kept, either for storage or for display.

Gunrunning the smuggling of guns, ammunition and their accessories into another governmental jurisdiction. A gunrunner is one who indulges in such practice.

Gunsel a slang term for a criminal armed with a gun.

gunpowder

Gunshot the firing of a gun; the shot fired from a gun; or the range of a gun.

Gun-shy a human or animal that is unduly frightened by the sound of gun fire.

Gun sling a strap of leather or other material, adjustable for length, attached to a rifle or carbine to make it easier to carry from the shoulder and to steady it when firing.

Gunslinger slang for gunfighter.

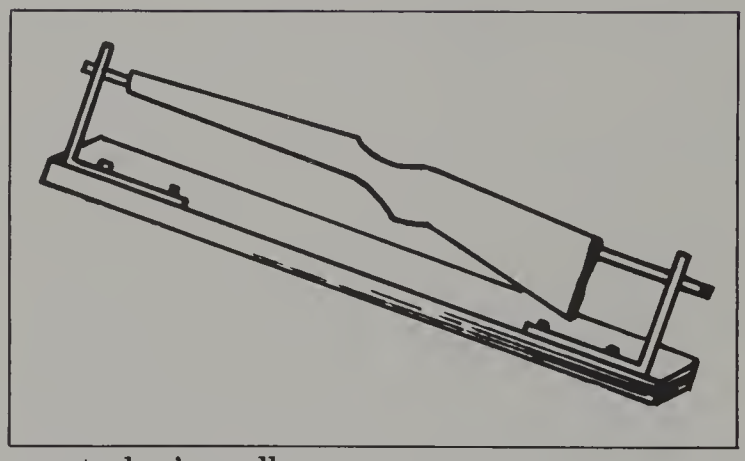
Gunsmith a craftsman who makes or repairs firearms, also known as an "armorer."

Gunspall a piece of chert shaped to produce a spark when used in a flintlock. By 1650, it was known as a stone suitable for such purpose.

Gunstock the shaped wood or plastic piece to which the metal parts of a gun are attached and which in rifles, carbines and shotguns also serves to steady the gun against the shoulder of the shooter.

Gunstocker's cradle a wooden device used by gunstock makers to hold a stock in working position. The cradle generally fastens the stock on a point at the butt end and in a clamp at the forend, so that it may be swivelled freely and locked in any given working position.

Gun-target line an imaginary straight line from the gun to the target.



gunstocker's cradle

Gun-toting the custom or habit of carrying a handgun with some regularity.

Gun wave the compressed air that fans out from the muzzle of a gun after firing. Also called "muzzle wave", "ballistic wave" or "bow wave."

Gyrojet gun a firearm developed during the 1960's for the purpose of firing a small rocket projectile. Now discontinued.

H

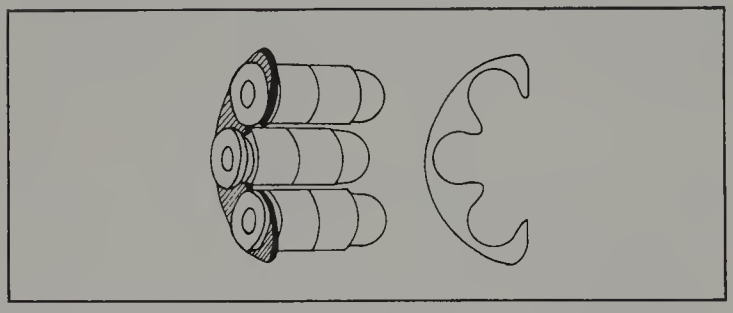
Hail shot used in early cannon and mortars, so called because a number of small projectiles were discharged in bulk. The present day term is grapeshot.

Hair trigger a trigger requiring but a light touch to cause it to fire the gun.

Half-bent the British term for half cock.

Half cock the position of the hammer of a gun when it is held by a notch in advance of the full cock position. In this position the hammer is locked and the gun relatively safe.

Half loaded the condition of an automatic weapon when the belt or magazine is inserted and receiver charged, but without the first cartridge in the chamber.



half-moon clips

Half-moon clips a revolver clip designed to hold the cartridges for one half of the cylinder to facilitate loading; also employed to adapt certain rimless ammunition for use in revolvers which normally accommodate only rimmed cartridges.

Hall, John Harris (1778–1841) an American inventor who in 1811, with William Thornton, patented the breech loading rifle that bore his name. Colonel Hall's rifle is considered to have been the first reasonably successful breech loading gun to be extensively used. He was a pioneer in making parts of his rifle interchangeable.

Hall rifle a rifle patented in 1811 by Colonel John H. Hall of the U.S., originally a flintlock, later adapted to the percussion system. Considered to be the first fairly successful breech loader. Adapted 1816 in the United States as an experimental arm and used in .54 caliber to a limited extent in the Seminole and Mexican Wars.

hammer

Hammer the piece that pivots on an axis to deliver a blow to a firing pin. It may be outwardly visible on a gun, or concealed within the so-called hammerless guns.

Hammer block a safety device often found in revolvers that prevents unintentional firing by "blocking" contact between the hammer and firing pin. When the trigger is activated, the block is designed to retract, thus clearing the path between the hammer and firing pin.

Hammerless a term intended to describe a firearm that does not have an exposed hammer; at times misleading because this does not necessarily mean that a particular gun lacks a hammer — oftentimes the hammer is designed so that it is completely enclosed in the frame or receiver. Some firearms make use of a spring-activated rod, which is appropriately called a "striker." In such instances, the striker is employed in place of a hammer.

Hammerless gun a gun with a wholly enclosed hammer and firing mechanism. It does not refer to a gun that uses a striker instead of a hammer.

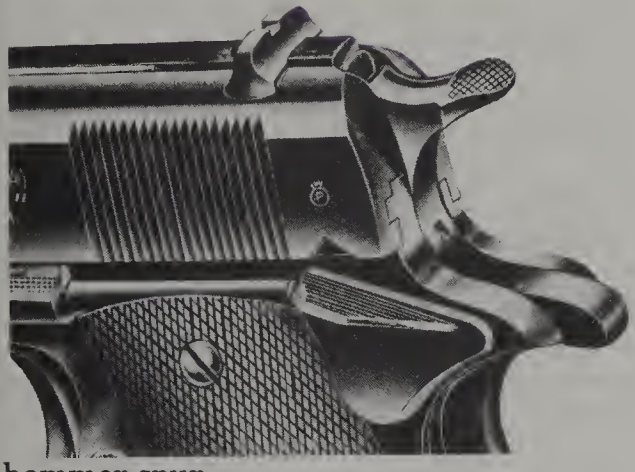
Hammerli a Swiss gun-making firm well known for its target rifles and pistols.

Hammer pin a pin that holds a hammer in its designed position in a gun and upon which the hammer turns.

Hammer shroud a detachable cover or protective guard for the hammer of a revolver to prevent the hammer from catching in clothing when the revolver is carried on the person.

Hammer spur in guns having an outwardly visible hammer, it is the spur-like rearward projection on the

hammer block



hammer spur

hammer, which furnishes a gripping surface and provides the leverage with which to cock the hammer.

Hammer strut a component part of the firing mechanism of a gun that puts pressure on the hammer.

Hand a long, thin steel piece mounted in the lockwork of a revolver to engage the cylinder so that it will rotate the distance of one chamber as the hammer goes to full cock. Also called "pawl."

Hand cannon probably the first one-man portable weapon to enter upon the scene after the introduction of the cannon. Loaded from the muzzle, the powder charge was ignited by applying a torch or red hot iron to a small amount of powder placed over a touchole that opened into the chamber. With a long hand cannon two men cooperated to fire it. One held the gun on his shoulder and aimed it while the other fired it.

Hand guard a part, usually of wood, surrounding that portion of the barrel of a firearm with which the shooter's hand will come in contact. It prevents the hand from being burned by a hot barrel. Common to military weapons.

Handgun a firearm capable of being carried and used by one hand, such as a pistol and revolver. The first recorded use of the term "handgun" appears in English records of 1386.

Handloading the practice of loading or reloading a cartridge case manually rather than by production machinery.

Hand shelf the lateral projection from the base of the pistol grip of some rifles, to provide a hand rest for the shooter when the stock is gripped. Sometimes called "heel rest" or "grip stop."

hand-stop

Hand-stop a wood or metal block mounted beneath the forend of a stock against which the hand of a

shooter may bear. It may be moved forward or rearward to accommodate the arm length of the shooter and then secured in that position. Mounted immediately behind the forend swivel, the hand stop is most often used on target rifles where a tightly fitted sling is necessary. The hand stop eliminates any possible pinching of the hand under the forward swivel.

Hang to lock the receiver or bolt of gun in open position.

Hangfire a term often misinterpreted by the layman: in the strictest sense, and according to professional ballisticians, the term "hangfire" refers to a minor delay in the ignition of a cartridge after its primer has been struck — a delay of not more than ten milliseconds. The average shooter will frequently refer to any delay in ignition as a "hangfire." However, if the delay exceeds ten milliseconds, it is more properly called a "squib-load" caused by partial contamination of the primer and/or powder charge by fluids such as oil or water. In rare instances, squib loads are created by foreign matter blocking, or partially blocking, the flash hole. On those occasions when a shooter experiences a firing delay, he should keep the firearm pointed in a safe direction and wait at least five seconds before opening the breech to investigate or remove the defective round.

Hangfire test the name of a test designed to determine the uniformity and promptness of fire of a type of ammunition.

Hardening steel basically consists in heating the steel to the required temperature and then quenching it suddenly in a cooling medium called a quenching bath. See "quenching baths."

Hardness of metals is determined by test, the Brinell and Rockwell tests being common standard tests for metals. There is a constant relationship between the tensile strength of steel and its hardness, thus knowing one will enable calculation of the other. See "Brinell hardness test," "Rockwell hardness test," and "Vickers hardness test."

Hard soldering soldering with silver solder.

Harmonica repeating system a multi-barrel rifle deriving its name from its shape. Also a term applied to a repeating rifle having a rectangular feed block inserted in the breech from the side, the block bearing a resemblance to a harmonica. This latter type made its appearance during the first half of the 19th century.

Harpers Ferry the name of the small-arms manufacturing plant and arsenal established in 1796 by George Washington at Harpers Ferry, West Virginia (then part of Virginia).

Harper's Ferry Rifle the name commonly applied to rifles manufactured at or designed by Harper's Ferry arsenal, such as the U.S. Flintlock Rifle, Model 1803, over 4000 of which were produced at Harper's Ferry between 1804 and 1807, and the U.S. Rifle Model 1841, a percussion lock arm made at the arsenal and by Government contractors between 1846 and 1855. The latter was noted for its accuracy. It was also called the "Yager" and the "Mississippi," the word Yager being a corruption of the German word "Jaeger" meaning "huntsman."

Harpoon gun a gun adopted to fire a barbed spear or javelin for shooting large fish, whales, etc. The head of the harpoon is sometimes filled with an explosive cap and charge.

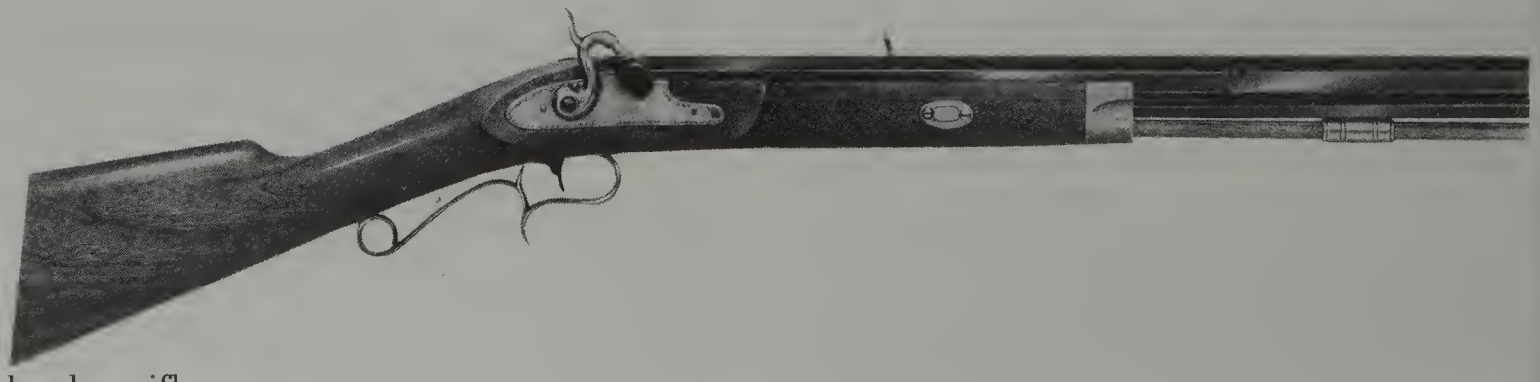
Harquebus (HARR kway bus) same as "arquebus."

Harquebusier, (HARR kway bus EAR) same as "arquebusier."

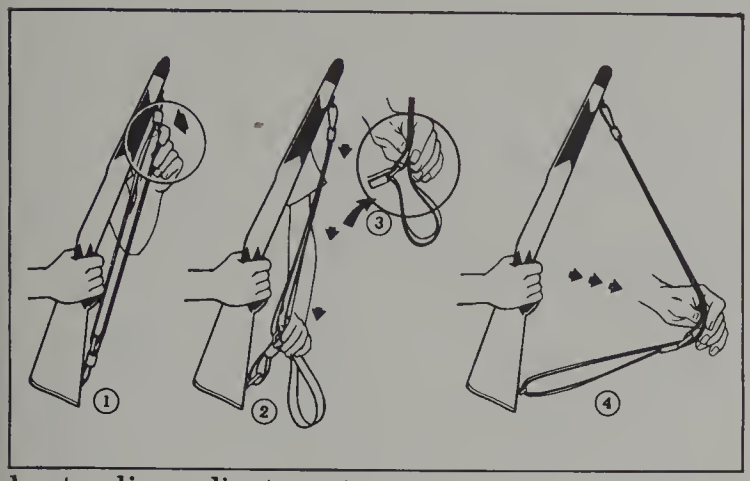
Harrington & Richardson the name by which pistols and revolvers made by Harrington & Richardson, Inc., of Worcester, Massachusetts, are known.

Hasty sling adjustment a quick method of adjusting a gun sling to help steady a rifle while shooting, but not as efficient as the "loop sling adjustment." The sling is passed under and behind the left arm.

Hawken rifle a form of muzzleloading rifle much favored in the American West and characterized by an octagonal barrel and slim halfstock. Generally produced in .50 caliber, or larger, Hawken rifles were made by the Hawken Brothers in St. Louis.



hawken rifle



hasty sling adjustment

HE, H.E. 1. abbreviation for "high explosive." 2. abbreviation also for "Hand Ejector" — a specific model of Smith & Wesson Revolver.

Head the small part in a revolver that holds the cylinder on its axis.

Headspace 1. is the distance between the face of the breech and that part of the chamber against which the cartridge bears. 2. in the case of machine guns, it is frequently a term applied to the distance between the base of a cartridge fully seated in the chamber and the face of the bolt.

headspace gauges

Headspace gauges any of the chamber-length gauges used by a gunsmith or range officer to test the safety of a given firearm. Generally, three such gauges are produced for a given caliber, i.e., "Go," "No-Go" and "Field" sizes. The "Go" gauge should easily chamber in the appropriate caliber. Acceptance of the "No-Go" gauge indicates the chamber is at the maximum size but not necessarily dangerous. Acceptance of the "Field" gauge, however, indicates that the chamber is oversized and the firearm unsafe to shoot. Headspace checks should only be performed by those trained in the use of the appropriate gauges. Headspace gauges measure only chamber length, not diameter.

headstamp

Headstamp the identifying marks that are stamped into the base of a small arms cartridge, or shotshell, by the maker.

Head wind a wind direction that blows directly from the target towards the shooter. Especially difficult for a skeet or trap shooter and can also be troublesome to the rifleman when shifting repeatedly a few degrees to one side or the other.

Heat heat is transferred because of a temperature difference between bodies and occurs by convection, conduction and radiation. Friction of a bullet passing through a bore, and the heat developed by the propellent powder, are the principal sources of heat in a firearm.

Heat treating the process of hardening or tempering steel through controlled heating and quenching.

Heat waves refers to the heat waves rising from a barrel that has become heated as a result of prolonged shooting — a condition that is particularly troublesome to the rifle marksman because heat waves tend to distort the sight picture. For this reason, some target shooters attempt to divert heat waves from the line of sight by suspending a broad webbed belt over the barrel, stretching the belt from the receiver to the muzzle.

Heavy weapon a weapon such as a heavy machine gun, mortar, howitzer or other cannon.

Heel the upper corner of the butt of a gunstock. This is the topmost rear butt position when the gun is held in firing attitude.

Heel plate another name for butt plate.

Heel rest See "hand shelf."

Heel-type bullet a bullet that terminates at its base in a cylindrical portion of smaller diameter than the body portion. It is this smaller portion that is seated in the mouth of a case. The bullet may be either of solid or jacketed type.

Height of site the altitude of a gun above some datum plane such as sea level.

Helix is a curve in three dimensions such as traced by the thread of an ordinary screw. On the other hand, a spiral is a curve in one plane, such as traced by a watch spring lying on a flat surface. The twist of the rifling in the bore of a firearm traces a helix, but commonly its path is called a spiral.

Henry, Alexander (1828–1894) a Scottish inventor of a system of rifling which, when combined with Frederic von Martini's firing mechanism, became the Martini-Henry rifle adopted in 1871 for the British Army.

Henry, Benjamin Tyler (1821–1898) an American gunsmith and manufacturer who, in 1858, developed a rimfire cartridge and, in 1860, patented certain improvements in the Volcanic rifle. The improved rifle became known as the Henry rifle, and subsequently, with minor changes, became the First Winchester rifle in 1866.

Henry rifle a lever operated repeating rifle with a 15-shot tubular magazine, designed by Benjamin Tyler Henry, which saw limited use in the Civil War after 1862. It was the pattern for the successful Winchester Models 1866 and 1873.

Henry, William (1729–1786) an American inventor and manufacturer of firearms, his rifles achieving a reputation for excellence.

High angle fire fire from a gun that is elevated above the elevation that produces maximum range; as this angle is increased, the range of the gun decreases.

High base, high brass pertaining to the construction of shotgun shells — these two terms are very often misunderstood: BASE — refers to the height of the base wad in a shotgun shell. This is a liner located near the primer aperture at the inner lower portion of the shell. So often referred to as "high base" or "low base," one assumes that manufacturers use two distinct dimensions. This is false — base wads vary greatly in size depending upon the type and quantity of powder to be used and upon the space needed for the wad and shot columns. Because too much wadding can be as detrimental as too little, commercial manufacturers use assorted base wads to compensate for variations in the powder, wad and shot portions of the load. Base height has no real relationship with the height of the brass head of the shell. Although, most frequently, the employment of a heavy powder charge would necessitate a low base wad and a high brass shell head. In reloading shotshells, one should always gauge the base wad height before selecting the balance of components. BRASS — refers to the length of the brass sleeve at the external base of a shotshell. This, too, is found in many different dimensions and there are no specific dimensions for "low brass" or "high brass." The manufacturer simply determines a height that is best suited to the performance of a particular shell. Trap and skeet loads are generally loaded with small brass head, and express and magnum loads are found in high brass shells.

High explosive the term applied to a compound, such as TNT, which detonates rather than explodes. The gases of combustion are given off so rapidly that such explosives cannot be used as propelling charges. Abbreviated as HE or H.E.

High intensity cartridge a cartridge producing a muzzle velocity of over 2500 feet per second. Between 1925 and 2500 feet per second, it is termed a high power cartridge.

Highlander all metal pistols, mostly flintlocks, of Scottish manufacture that were made from about 1600 until the first part of the 19th century.

High order detonation a complete and instantaneous explosion.

High power cartridge a relative term, but usually taken to mean a cartridge producing a muzzle velocity of between 1925 and 2500 feet per second. Over 2500 feet per second, it is termed a high intensity cartridge.

High pressure test ammunition ammunition that is loaded with an excess charge of propelling powder. It is used only in proof firing.

High velocity as defined by the U.S. Army for small arms ammunition, is a muzzle velocity lying between 3500 and 5000 feet per second. See "hypervelocity."

Hindustan stone See "India stone."

Hinged frame firearm is one in which the barrel or barrels are hinged to the front end of the frame and mechanically locked together to cause the chambers and breech to be in contact when the gun is to be fired. Upon unlocking, the gun may be "broken." Comparable revolver construction is found in the top break revolver.

Hip shooting shooting with the firearm held in the vicinity of the waistline of the shooter.

Hi Standard the name applied to the products of the High-Standard Manufacturing Company of Hamden,

Connecticut, firearms manufacturers.

Hit the impact or point of impact of a projectile on a target.

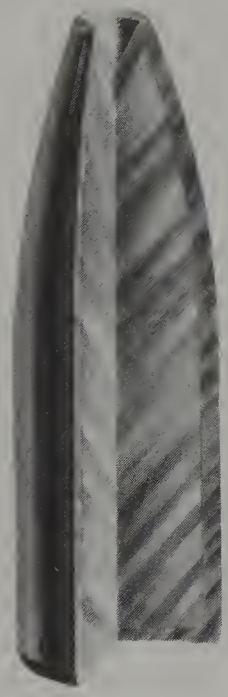
H-mantle bullet trade name for a particular type of sectioned bullet, invented and manufactured by the German RWS Munitions Works.

Hold a term relating to a shooter's ability to hold a firearm in a steady aiming attitude.

Holding is continued aiming at the target while applying pressure to the trigger.

Holland & Holland the registered trademark of Holland & Holland Ltd., of London, England, in use since 1885, more recently applied to a modern form of English hammerless sidelock featuring a double sear designed to prevent accidental discharge. Illustrated in the Appendix.

Hollow ground screwdrivers screwdrivers that are made with little or no tapered surfaces; designed to minimize the possibility of burring screw heads.

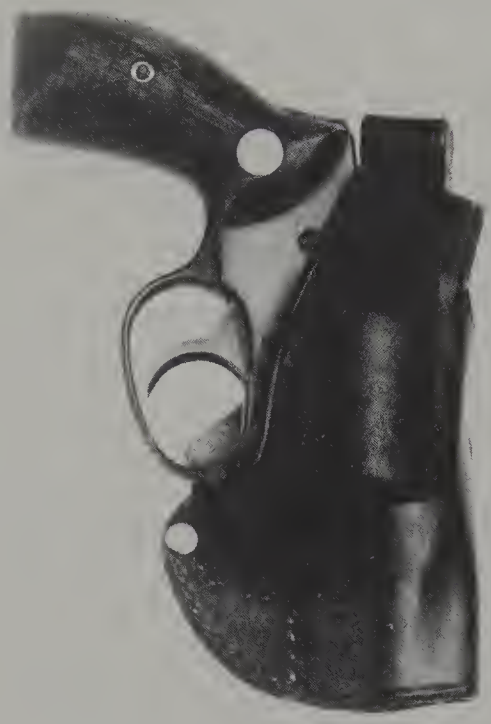


hollow point

Hollow point a bullet having a cavity in its nose to increase the expansion of the bullet when it impacts with a game target.

Holster a case of leather or other tough material to hold a handgun, such as a pistol or revolver, and adapted to be attached to a belt, shoulder strap or saddle.

Honing the process of removing small quantities of material or improving the surface of a piece by use of a fine stone.



holster

Hooded sight a front sight that is equipped with a metal canopy. Designed to eliminate light reflections.

Hook of lump the semi-circular cut in the forwardmost lug of a double barrel shotgun (or other similar type of hinged-barrel firearm). It is the "hook" that engages the hinge pin and provides the swiveling action required to open and close the breech.

Hook plate a hook-shaped metal butt plate that is used extensively in target shooting with the rifle. The top-most extension of the hook bears against the upper part of the shoulder, while the lower extension (which is generally longer) fits snugly under the armpit. Hook plates tend to help the shooter steady the rifle.

Hoppe the trademark issued to the Frank A. Hoppe Company of Philadelphia for a line of firearms lubricants and cleaning accessories.

Horizon the line where the sky and the earth appear to meet.

Horizontal clock system a system used in describing the direction of the wind. The firing point is considered the center of a clock dial and the target at 12 o'clock. A 3 o'clock wind is one coming directly from the right; a 9 o'clock wind is one coming directly from the left.

Horizontal range the distance measured on a level line between the gun and a point directly above or below a target.

Horse pistol a large pistol, generally a flintlock of large bore, formerly carried by man on horseback across the pommel of the saddle.

Hot blue a process for blueing steel in which the subject material is sequentially immersed in a boiling degreasing solution, a boiling clear water rinse, and finally, a boiling acid solution which imparts an overall blue-black finish. Certain steel alloys, particularly those containing chromium or nickel, tend to resist conventional hot blueing formulas. To blue such alloys, various other techniques and chemicals must be employed. Some double barrel firearms are made with tin soldered ribs and these cannot be hot blued because the boiling acid solution tends to melt the solder causing separation of the barrels. Tin soldered firearms (sometimes referred to as "soft soldered") must be cold blued. Only rifles, handguns and shotguns having silver soldered components may be hot blued.

Hotchkiss the first successful gas piston operated automatic machine gun pioneered in 1895. In 1900, it achieved military recognition. Modified from time to time, it was used in World War I and pointed the way to the successful .50 caliber machine gun used by the United States in World War II.

Hotchkiss, Benjamin Berkley (1826-1885) an American who, while living in France, developed the rifle that was adopted by the U.S. as its first official bolt action magazine arm. He developed an improved metallic case and, in 1875, manufactured a hand operated machine gun in France which outwardly resembled the Gatling gun.

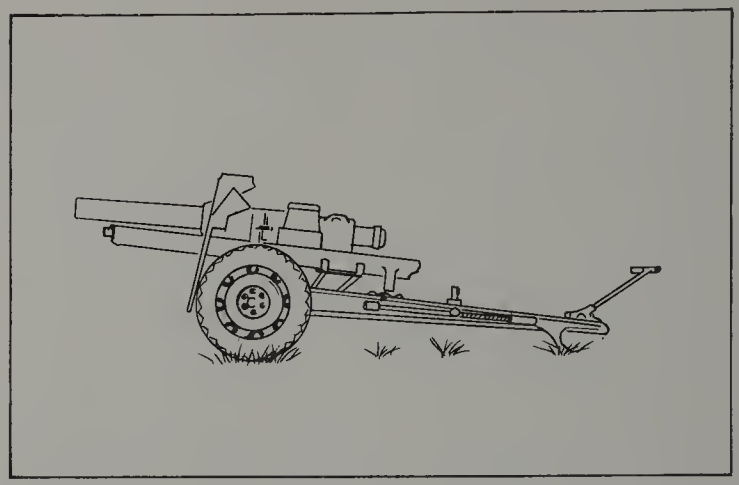
Houiller, B. a French inventor whose patents in 1847-1850 relate to pin, rim and center fire ignitions with the use of full metal cases.

Housing a frame, support or enclosure for holding a part or parts of a firearm in place.

Howitzer (HOW it sir) a cannon with a medium length barrel, firing shells with a medium muzzle velocity at a high angle of fire capable of reaching targets protected from flat trajectory guns.

HP abbreviation for hollow point when referring to bullets so made. It is also the abbreviation for horsepower.

Hull a general term used to describe a cartridge casing, usually employed only in referring to shotshell casings.



howitzer (how it sir)

Hunting scope is distinguished from a target or varmint scope by providing a larger field of view.

Hunt, Walter (1796-1859) an American machinist and inventor. One of his inventions was a repeating rifle that formed the basis for the later improvements by others and became the basis for the Winchester rifle.

Husqvarna a Swedish rifle-making firm that has now discontinued operations.

Hydrochloric acid whose chemical symbol is HC1, commonly called muriatic acid, is a solution of hydrogen chloride in water. Among other uses, it is employed alone or with other acids as an etching fluid.

Hydrometer an instrument for determining the density or specific gravity of a liquid.

Hygrometer an instrument for measuring the amount of moisture or humidity in the air.

Hygroscopic (HIGH grow SKOP ick) describes something that absorbs or attracts moisture from the air. To reduce the humidity in a gun cabinet or other closed space where firearms are stored, a desiccant (drying agent) may be used. Silica gel is a typical drying agent.

Hypervelocity as defined by the U.S. Army for small arms ammunition, is a muzzle velocity of 5000 feet per second or more. See "high velocity."

I

Identification of firearms 1. the determination of the make and model of a given firearm, usually only by visual examination of size, shape, markings, material and the characteristics associated with certain firearms. 2. the determination by scientific means of the firearm from which a given bullet or empty case was fired. By microscopic examination and other laboratory techniques, the markings on the bullet or case may be compared with the individual characteristics imparted by the manufacturing process of a firearm.

Ignite to set fire or begin to burn.

Igniting charge in modern ammunition, it is in the primer. In former days, it was a separately loaded charge used to ignite the propelling powder.

Ignition 1. in firearms, it is the setting on fire of the propellent powder charge. 2. illustrative of the temperature at which certain substances ignite — guncotton, 430 degrees F; nitroglycerin, 490 degrees F; rifle powder, 550 degrees F; charcoal, 660 degrees F; dry pine wood, 800 degrees F; dry oak wood, 900 degrees F.

Ignition time the time that elapses between the instant the firing pin strikes the primer and the instant the built up pressure of the propelling gases has caused the bullet to start from its seat. Tests with modern ammunition and firearms showed ignition time to be in the neighborhood of .0002 second.

Illegal targets common to skeet and trap shooting, a term used when referring to clay pigeons thrown at distances or angles which do not meet the specifications of the rule book. The shooter is allowed to refuse such targets.

Illumination in a telescope, means the amount of light that reaches the eye through the telescope. The brightness of the image seen depends on the illumination and varies inversely as the square of the magnifying power. Thus, if the magnifying power is doubled, the resulting image will be only one-fourth as bright.

Image that which is made visible to the eye through a sighting instrument.

Image plane the collected points of focussed light rays at which the image is formed for viewing, after passing through an optical instrument.

Impact the striking of a bullet or other projectile against a target or other object.

Impact, angle of See "angle of impact."

Implode, implosion to burst inward.

Impressed checkering a modern, inexpensive, method for checkering or decorating the grip surfaces of wooden gunstocks. While traditional hand checkering is considered more desireable, it is a time-consuming operation; thus quite costly. Impressed checkering is pressed into the smoothened wood surfaces with considerable force and serves to minimize prices of popularly priced firearms.

IMR abbreviation for DuPont's Improved Military Rifle powders.

Inactivate to render a firearm incapable of functioning as such.

Incendiary bullet (in SEN dee er ee) a bullet which on impact releases its contained chemical composition. The composition on release generates enough heat to start a fire.

Indexing the practice of rotating a unit of work in a mechanical jig for the purpose of jewel-indexing, engine-turning, etc.

India stone a natural stone, used with water rather than oil, to give an initial smoothing and finishing for metal parts, such as sears, ejectors, etc. Also called Hindustan stone.

Inert a round of ammunition, grenade, bomb or mine containing no explosive or active chemical agent.

Indicators pin-like devices that protrude from a firing mechanism when the arm is loaded and cocked for firing, and which are recessed when the arm is fired. Indicators permit a shooter to determine by touch whether or not his firearm is in a shooting attitude.

Inertia that property of a body by which it will remain at rest, or in uniform motion on the same straight line or direction, unless acted upon by some external force.

Inertia firing pin a relatively heavy firing pin that normally lies within its tube. That is, the front end does not contact the primer of the cartridge when the gun is in loaded condition, nor does its rear end project so as to bear any pressure from the hammer. Thus, theoretically, the loaded gun may be carried with the hammer down. When the hammer is raised, the mainspring projects the rear end of the firing pin toward the hammer. When the hammer falls, the momentum of the firing pin and its inertia causes it to strike the primer.

Inertia lock See "blowback action."

Infinity in optics, a term used to describe the setting of a scope or camera when adjusted to focus at unlimited distances.

Inflammable capable of being easily set afire.

Infra red light an invisible "light" radiation of frequencies ranging beyond those of visible red. Used in firearms identification to photograph powder combustion deposits on skin and clothing not otherwise detectable.

Inhibitor in chemistry, is a substance capable of stopping or retarding a chemical reaction. Inhibition of corrosion of steel is accomplished by the use of inhibitors, i.e., oxidizing or coating materials of various kinds. In powder manufacture, the term "stabilizer" is used to describe a chemical constituent that tends to retard or stop the chemical breakdown of a powder. Sometimes loosely referred to as a deterrent.

Initial recoil recoil before the bullet leaves the muzzle during which a small arm moves a very small fraction of an inch.

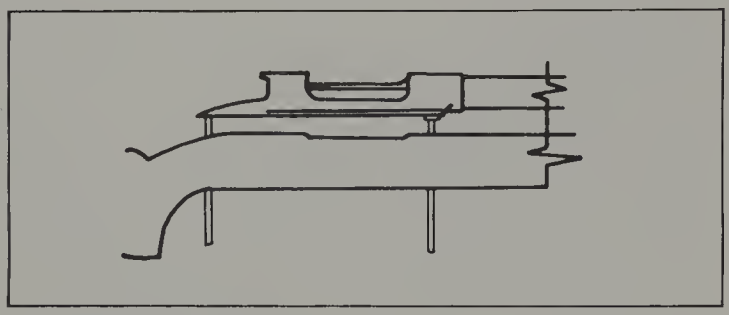
Initial velocity same as "muzzle velocity."

Initiator a small quantity of very sensitive and powerful explosive used to start the detonation of a less sensitive explosive. Mercury fulminate is the principal explosive used as an initiator.

Inlays decorative panels or patterns of contrasting materials recessed into wood or metal surfaces.

Inletting the process of recessing metal components in a wooden stock or grip by carving.

Inletting screws extra long screws that are employed by gunsmiths to facilitate stock inletting



inletting screws

work. Temporarily replacing the standard action screws, inletting screws are necessary to align the barrelled action over the trigger guard assembly at the start of rifle inletting operations. The normal action screws are too short for this purpose.

Inserts 1. shell adapters for shotguns that permit large gauge shotguns to be converted for use with a smaller shell by means of an auxiliary bore tube, called an "insert." 2. interchangeable front sight inserts commonly employed with a target front sight, as used on a target rifle.

Inserts, sight interchangeable blades for a front sight that permit selection of a type best suited for given shooting conditions. Commonly employed on target guns.

Inside lubricated bullet a cartridge having a bullet seated within the case deep enough so that the grooves, i.e., cannelures, bearing lubricating grease or wax are inside the mouth of the case.

Inside pinfire a form of cartridge, patented in 1869, having a bulb shaped case within which the firing pin lay crosswise, resting at one end against a cup containing fulminate, also lying within the case, and having its other end just inside a blister formed on the outside of the case. When the hammer struck the blister, it detonated the powder charge in the case.

Instinct shooting generally refers to the act of shooting, instinctively, in the direction in which the hand or arm holding the firearm points, without relying upon the gun sights. Shooting from the hip is an example. The "quick kill" method of military training is another example of its use.

Instruction firing practice firing carried out on a practice range under the tutelage of an instructor and sometimes by the "coach-and-pupil" method.

Instrumental velocity the velocity of a projectile measured at a designated point in its trajectory by instrumental means.

Interchangeability 1. the ability to interchange similar parts in firearms without impairing reliability or accuracy. By setting suitable tolerances in the design and by proper gaging methods in production, interchangeability has been made possible to a large degree. A system of interchangeable barrels was used as early as the 16th century. 2. the ability to use certain cartridges in place of others without causing a malfunction. Tables are available listing cartridges that are interchangeable. Identity of calibers is not alone indicative of interchangeability. See Appendix.

Interchangeable manufacture the manufacture of component parts of an assembled product so that they may be interchanged with similar parts of a like assembled product. Eli Whitney, in 1798, laid the foundations for interchangeable manufacture in his production of muskets for the Government. When this system is properly practiced, a rifle, for example, may be assembled from any of the number of parts made for it without the need for reworking the parts used. By contrast, see "selective assembly."

Interior ballistics the science that deals with the movement of projectiles within the bore of a gun to ascertain the effect of the various influencing factors, such as size, weight, shape, rifling, etc.

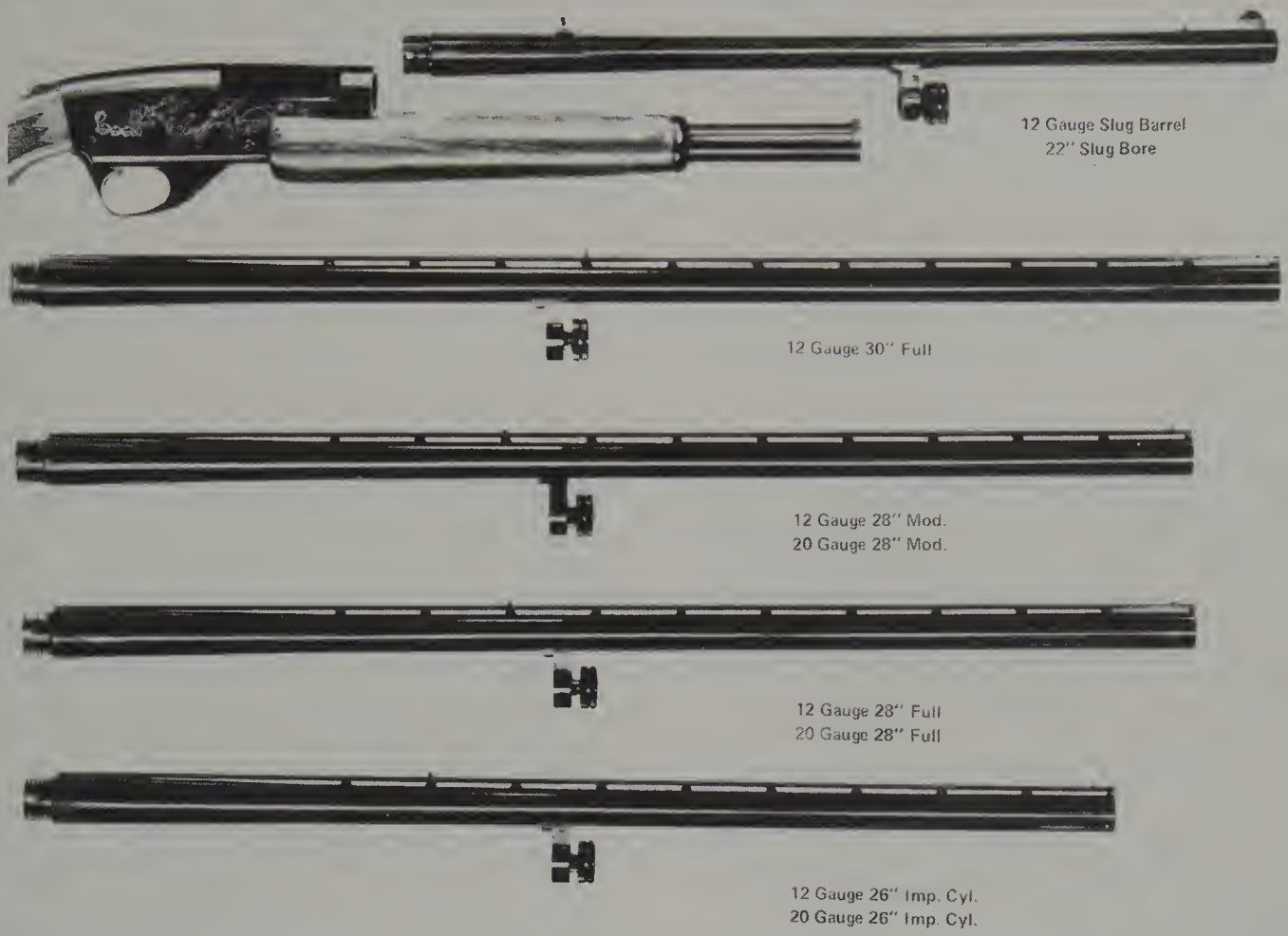
International Free Rifle a type of rifle used in international target competition. The term "free" stems from the fact that few restrictions are placed on the guns used in such competitions. Other forms of target competition have established limitations for gun weight, trigger weight, sighting instruments, and accessories, etc.

International Shooting Union founded in 1921 to succeed the original organization, "L' Union Internationale des Federations et Association Nationales de Tir," which existed between 1907 and 1915. The International Shooting Union promotes and develops international shooting sports, organizes World championships, supervises Olympic competitions and is responsible for the rules governing each of the international shooting sports. Membership is comprised of officially recognized national shooting associations or federations. The headquarters of the ISU is not fixed at one location but is generally moved, after each election, to the town and country of its new President. In the United States, the ISU is represented by the National Rifle Association, 1600 Rhode Island Avenue NW, Washington, D.C.

Interpupillary setting the millimeter scale on the hinge of a binocular that indicates the separation adjustment of the eyepieces. In focussing a binocular, the user must first set the eyepieces to coincide with the distance between his eyes.

Interrupter a safety device incorporated in a shell fuze to prevent its activation until the projectile has left the muzzle of the gun, thus making it "bore safe."

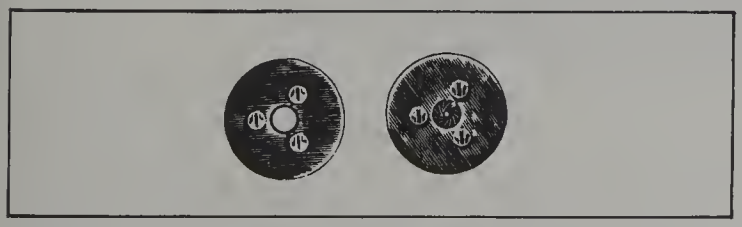
Inversion the act of inverting, or of turning upside down. In shooting, it specifically refers to the image that is picked up by the objective lens element of a


12 Gauge Slug Barrel
22" Slug Bore
12 Gauge 30" Full
12 Gauge 28" Mod.
20 Gauge 28" Mod.
12 Gauge 28" Full
20 Gauge 28" Full
12 Gauge 26" Imp. Cyl.
20 Gauge 26" Imp. Cyl.

interchangeable manufacture

scope and inverted. A subsequent lens system, called the erecting lens, then restores the image, rightside up, for viewing.

Investment casting also known as precision casting or lost wax process. A wax or frozen mercury pattern is made for every casting produced by injection molding into metal dies. The pattern or model is placed in a metal flask and the refractory investment material poured around it. After the refractory material has hardened, the pattern is melted and subsequently metal is poured into the mold. After hardening, the investment is broken away, leaving the metal casting in the form of the pattern. Its high cost limits its use to small castings. See "lost wax process."



iris

Iris an adjustable diaphragm, comprised of a number of movable segments, that enables the user to alter the diameter of the central opening (aperture). Commonly found in the lens mechanisms of cameras but also used in elaborate metallic sighting instruments.

Iris disc the sighting disc of a receiver or "peep" sight equipped with an iris diaphragm.

Iron a chemical element which is the principal component of all commercial iron and steel. Pure iron is silver in color, malleable and ductile, melting at 1535°C (2795°F) and weighs 491 pounds per cubic foot.

Iron pyrites See "pyrites."

Iron sights a term that is broadly used to describe metallic sighting instruments, covering common open sights as well as aperture-type receiver sights (as opposed to scope sights).

ISU abbreviation for International Shooting Union.

Ithaca a trademark of the Ithaca Gun Company of Ithaca, New York, applied to firearms of their manufacture. The Ithaca Gun Company was founded by the Smith brothers in 1880 and was well known for its fine line of double barrel shotguns until the 1930's.

Since World War II, they are better known for their Model 37 slide action shotgun, although they also manufacture a number of other models.

Iver Johnson the trademark for revolvers made by the company of that name, best known for providing a safety feature called "hammer the hammer safety."

Ivory grip grip stock for an automatic pistol or revolver made from genuine ivory.

J

Jacket the metal casing of copper or steel that forms the outer covering for a lead bullet. Called an "envelope" in Great Britain.

Jag a type of cleaning rod tip of cylindrical shape

jag

upon which a cleaning patch may be rolled and held in place.

Jager, Jaeger a German word meaning hunter, applied to a percussion lock, muzzleloading hunting rifle noted for its accuracy. Often called the "1842," it became known in the United States as the Yerger (a corruption of "Jaeger") and the Harpers Ferry rifle.

Jam a stoppage preventing the firing of a gun, usually caused by overheating, faulty ammunition or a broken part.

Janka hardness a measure of hardness of wood which is taken to be the load in pounds required to imbed a .444 inch diameter ball to one half its diameter in the wood.

Japan drier a drying agent used in certain stock finishing preparations. Most commonly used in conjunction with boiled linseed oil. Japan drier consists of a solution of mineral spirits containing from one to five percent lead, and from two-tenths of one percent to one percent of cobalt, or a mixture of manganese and cobalt.

Jaws 1. the vise-like device on a flintlock hammer (i.e., cock) used to hold the flint in place. Also known as the "doghead." 2 the gripping plates of a vise.

Jenks the name by which rifles and carbines were known that used the breech loading system invented by William Jenks of Columbia, South Carolina, and patented by him May 25, 1838. Both rifle and carbine were adopted by the United States as standard weapons. It was a single loader taking separate loading ammunition, i.e., the bullet and loose charge of powder were separately placed in the chamber.

Jennings, Lewis an American inventor of a tubular

jewelling

magazine lever action rifle patented in 1849. That was one of the first reasonably successful repeating arms and was a forerunner of the Winchester rifle.

Jessen, Niels Staal (1797–1880) a Danish gunmaker best known for his work on muzzleloaders, his oval gun, in 1851, arousing the interest of other gunmakers. The bore was oval in cross section and such section followed a helical curve the length of the barrel, thus constituting in effect two broad grooves to give spin to the elongated ball as it traveled through the bore.

Jeweler's rouge a fine abrasive metal-polishing compound. Generally available in stick form, jeweler's rouge is used to treat cloth polishing wheels before actual polishing operations commence.

Jewelling See "engine turning."

Jezail (je Zile) a long barrelled matchlock gun of Afghanistan proper, having a crooked stock. While the Afghan stock has a very deep, narrow butt, the jezail stock is small and oval at the butt, making it clearly distinctive.

Jig a holding tool or device that simplifies manufacturing operations on a given component. The use of jigs assures manufacturing uniformity and the interchangeability of parts.

Johnson a semi-automatic rifle having a short recoil system, a rotary bolt locking with eight lugs and unlocking by the rearward movement of the sliding barrel.

Johnson, Cornelius an English gunsmith who, as early as 1521, manufactured pressure lock guns in the Tower of London, perhaps from original German designs. The pressure lock is basically the thumb cocked single action as known today.

Johnson, Melvin M. an American, inventor of the Johnson rotary magazine, semiautomatic recoil-operated rifle just prior to World War II.

Jorgensen, Erik chief armorer at the Kongsberg Arms Factory in Norway, who cooperated with Ole H. Krag to produce, in 1888, the rifle known as the Krag-Jorgensen. Modified, this rifle, in 1892, became the U.S. Magazine Rifle, caliber .30, Model 1892, popularly known as the "Krag" or "American Krag."

Joslyn an American percussion lock breech loading carbine patented in 1855, having a ring above the small of the stock for raising the breechlock for loading.

Journee's Formula a formula for determining the approximate maximum range for a shotgun, namely that the maximum range in yards is about 2200 times the shot diameter in inches. For example, number one shot, being .16 inches in diameter, will have a maximum range of $.16 \times 2200 = 352$ yards.

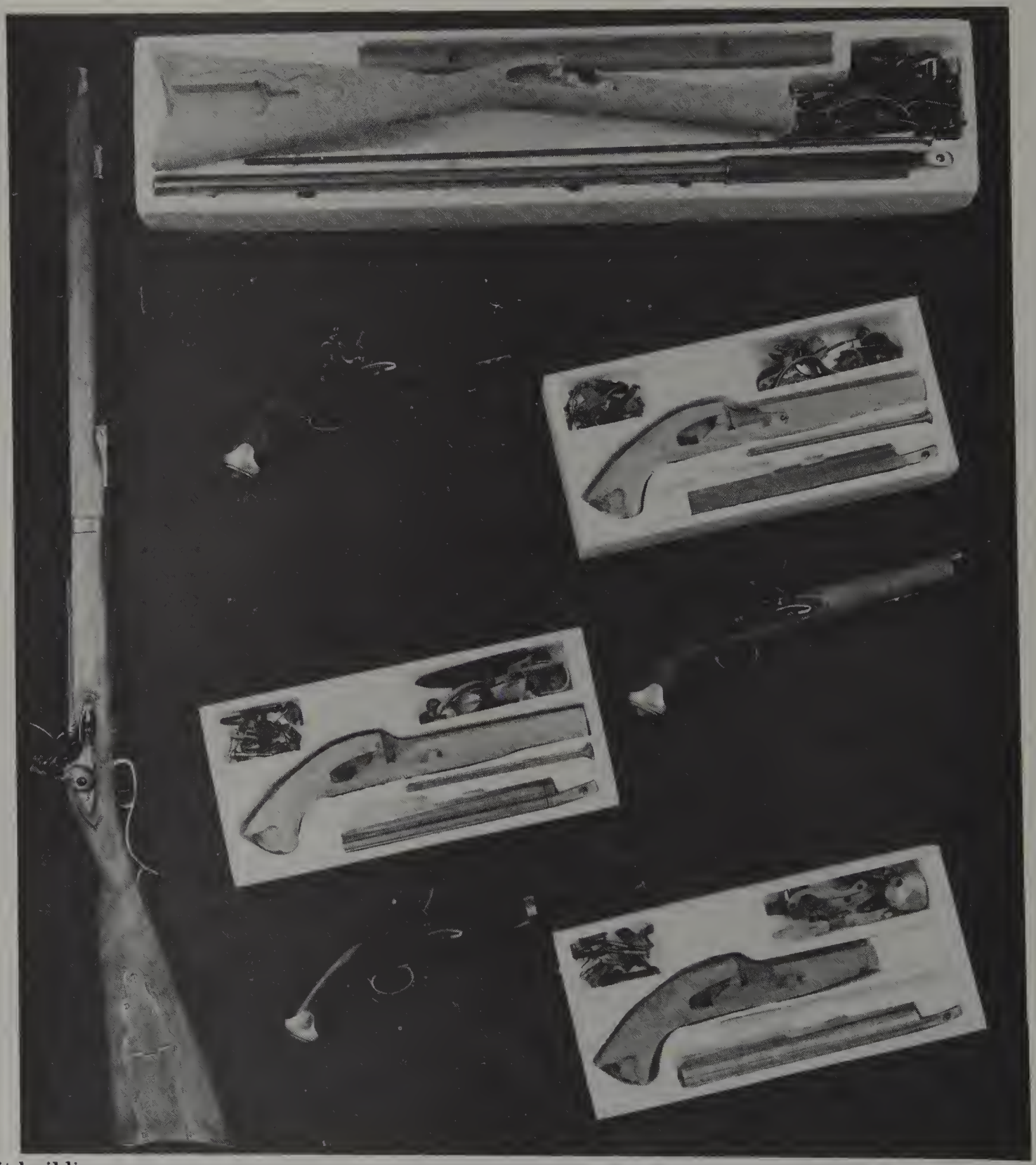
Jug choke a trial and error method of correcting an inadequately choked shotgun barrel. In "jug choking," the gunsmith polishes a slight recess in the bore about one inch from the muzzle. This recess tends to let the shot bunch-up before clearing the muzzle and, if done properly, can give the effect of a tighter choke. A slow and arduous process, because the gunsmith must alternate between polishing and test-firing until he achieves a satisfactory shot pattern, or until he determines that a particular barrel simply will not lend itself to jug-choking.

Jump one of the three movements set up in a firearm upon discharge. It occurs while the projectile is still in the gun. It is the turning movement that tends to take place upward and backward about the point of resistance provided by the shooter. See "muzzle jump."

Junior Class shooter in rifle or pistol competition, a shooter who has not yet reached his (or her) 19th birthday is classified as a "junior." In skeet or trap competiton, a shooter who has not yet reached his (or her) 18th birthday is classified as a "junior."

K

Kalthoff repeater a flintlock rifle believed to be the first military arm having a magazine in its butt that easily fed powder charges to the breech. The Kalthoff family consisted of a number of gun makers and was originally located in Solingen, Germany. In time, the family split up and its members dispersed throughout Europe. Thus, from approximately 1640 until 1670, Kalthoff gun makers influenced firearms designs in Germany, France, Holland, England, Denmark and Russia. Peter Kalthoff's Dutch patent of 1641 resulted in the issuance of his flintlock repeater to a company of the Dutch army circa 1658.



kit building

Keeper a loop that holds straps or cords together, such as those used on gun slings.

Kentucky rifle a truly American flintlock rifle that in the period 1725–1728 was initiated in Lancaster, Pennsylvania by gunsmiths of German and Swiss origin who improved on European designs. Used in the Kentucky wilderness, that name attached itself to the rifle about 1770. It was a popular weapon until about 1830 and survived as a hunting firearm until about 1850. In that twenty-year period, many were converted to the percussion system. Handmade by at least 500 different gunsmiths over the years, and re-

flecting individual tastes, no one description fits all. Generally, however, it was a long barrelled, relatively lightweight rifle with a short, crooked, stock having a rather small bore (usually .32 to .50 caliber). Also called a Pennsylvania rifle or American long rifle.

Kentucky windage in shooting, the practice of compensating for differences between the alignment of the sights and the path of the bullet or, of compensating for the effect of wind on the bullet, by aiming to one side of the target rather than directly at it.

Key, keyway a key is ordinarily a piece of metal shaped to fit in a channel or passageway and intended to link two or more separate components. The brass crossbars or keys passing through the forestock, the barrel lug, and the stock on the opposite side of a muzzleloader are termed "keys" and "keyways."

Keyhole the elongated hole left in a target by a keyholing bullet.

Keyhole shot, keyholing a shot that makes an elongated hole in a target, because the bullet did not strike it straight on but attained a yaw in flight due to insufficient spin. Wear of the bore at the muzzle is a major cause of keyhole shots.

Kick a term used by shooters to describe the effect of the discharge of a gun upon the shooter. It results from the recoil, muzzle blast, torque and thrust varying with the shape of the stock. It is not recoil only.

Kicker part of the mechanism on some recoil operated guns that uses the recoil to draw back a rod, which in turn forces home the cartridge.

Kiefuss, Johann an early inventor whom historians credit with having invented the wheellock in 1517 in either Nurenberg or Vienna.

Killing power the ability of a projectile to kill which depends on a number of factors, such as velocity, shape, sectional density, weight, diameter and material.

Kit building the practice of building a firearm from a factory-produced kit — a popular pastime among muzzleloading enthusiasts. Generally the hobbyist is required only to fit, assemble, polish, and finish the various wood, brass and steel component. (Modern rimfire and centerfire firearms are not sold in kit form.)

Knapper the craftsman or artisan who cuts and shapes flints for flintlock firearms.

Kneeling position, handgun as prescribed in U.S. Army and Air Force Training, a right handed shooter kneels on the right knee with left knee up and pointed toward the target. The right knee is about 4 inches behind the left heel. The weight of the body is distributed on the calf and heel of the right leg. The left elbow is projected beyond the left knee, allowing the fleshy part of the arm to rest on the knee. With proper two-handed grip, the gun is aimed at the target. A left-handed shooter reverses the position. This position is used to obtain increased accuracy, in rapid fire, at longer ranges.

Knife pistol an oddity that may in several ways combine a knife with a pistol.

Knocabout the trade name for a .22 caliber single shot utility pistol produced by the Sheriden Company of Racine, Wisconsin in the 1950's. Now discontinued.

Knockdown effect the ability of a projectile to stop a moving animate object or hurl it backward. So many factors enter into this effect that it is difficult to measure or foretell with any degree of accuracy.

Knockout the ram of a shotshell reloading tool, used to expel the finished shell from the sizing die.

Knot a unit of speed equivalent to one nautical mile (6080.20 feet) per hour. Wind speed is sometimes expressed in knots.

Known distance firing firing over a distance that is known.

Known distance range a range having target positions a known distance from the firing line.

Knuckle duster a handgun with a metal butt having an opening in the center so it may be grasped with the fingers and used to strike an opponent.

Knurling the scoring or cutting of diamond-like pat-

knurling

terns in a metal surface to provide a grip for the hand or finger.

Kollner, Casper or Gasper a Viennese gunsmith who, in reports of 1498, was credited with producing barrels having straight grooves in the bore.

Krag, American the popular name given the U.S. Magazine Rifle, caliber .30, Model 1892, which was a modification of the Krag-Jorgensen rifle. It was first issued to troops in October 1894, and saw service in the Spanish-American War of 1898.

Krag, Ole Herman (1837–1912) a Norwegian Army officer and gun designer. He invented the rifle that bears his name, the first model being produced in 1868. The one officially adopted by the U.S. in 1892, was produced in 1888 with the aid of Erik Jorgensen and subsequently modified to U.S. military specifications.

Krag-Petersson rifle the repeating rifle that Ole H. Krag and Axel J. Petersson introduced into the Norwegian and Danish navies in 1874.

Krupp steel steel made by the famous German Krupp Works.

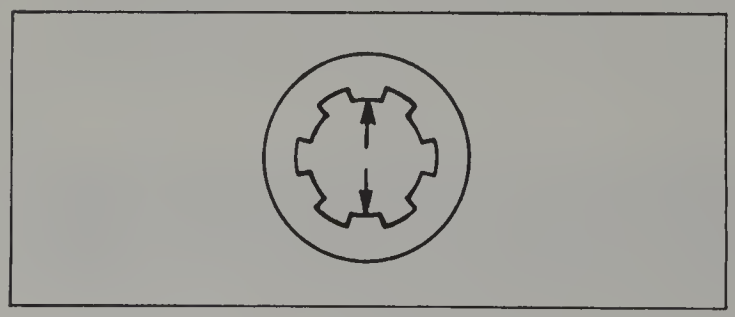
L

Lacquer a resinous substance used to give a lustrous surface to polished metal surfaces such as brass, or to wood surfaces. The main constituents are shellac and alcohol plus other substances to give the desired tint. It is sometimes used in gunstock finishing.

Ladder an artillery term for bursts of three rounds, each fired in the same direction, but aimed to strike at 300-yard intervals; the first round being fired to strike at the greatest range.

Lahti the 9mm, 9 shot semiautomatic pistol adopted in 1935 as a military weapon of Finland and in 1940 by Sweden.

Laminated barrel See "Damascus barrel."



land diameter

Lance a spear-like weapon once carried by light cavalry, having a long shaft and a sharply pointed steel head.

Land diameter the diameter of a rifled bore measured from the top of one land to the top of the opposite land.

Lands the raised portions between the grooves of a rifled bore.

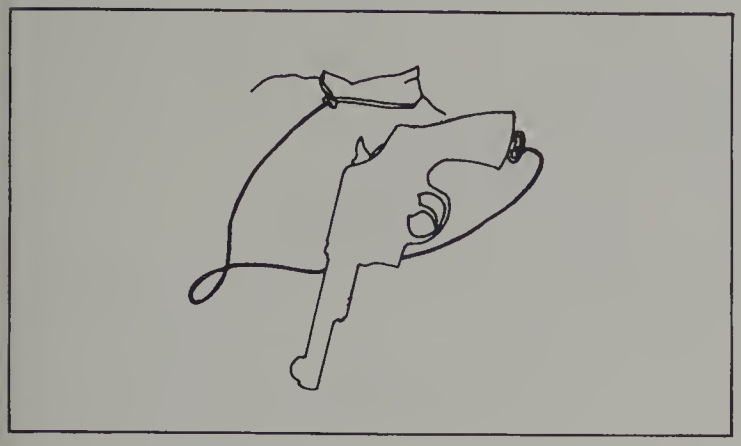
Landscape target a target displaying the picture of a land scene.

Lanolin a sheep's wool fat derived as a by-product in the preparation of raw wool. It is an excellent rust preventative. A grease made of equal parts of anhydrous lanolin and white petroleum jelly (Vaseline) is used by many gunsmiths.

Lanyard a strong cord worn about the neck or shoulder and attached to a side arm to prevent it from being lost. It also may refer to a strong cord with a hook at one end used to fire cannon, pyrotechnic projectors, etc.

Lanyard ring the ring secured to the butt of some revolvers, or to the side of some saddle carbines, to which a lanyard may be attached.

Lap to polish — as to polish the bore of a barrel by means of repeated applications of a fine abrasive.



lanyard

Lapping the practice of polishing a barrel bore or other metal surface by abrading it.

Lapping compound a fine paste abrasive used in polishing metal.

Latch a movable piece which may enter a notch or opening and hold two objects together. In the case of a revolver with a swing-out cylinder, it is the thumbpiece which may be moved to withdraw the locking bolt which holds the cylinder in place, thus enabling it to swing outward.

Lateral deflection the horizontal angle between the axis of the bore and the line along which the gun is sighted. Technically called the alteral deflection angle.

Lateral deviation the distance between the point of impact and the target.

Lateral jump the horizontal angle between the axis of the bore when a gun is fired and the axis of the bore at the instant the projectile leaves the gun. This is the horizontal component of the "angle of jump." The vertical component is called "vertical jump."

Lateral lead (LEED) the angle by which the gun is pointed in advance of the target to allow for wind, drift, and travel of the target.

Lathe a machine that is basically designed to hold and rotate a piece of material so work may be done upon it. Lathes are made in many designs and sizes and classified accordingly. For example, bench lathe, turret lathe, chucking lathe, and automatic lathe, to name a few.

Lay to direct or adjust the aim of a machine gun or artillery piece. Also means the setting of such a weapon for range, direction, or for both.

Laying the procedure of pointing a gun for range, direction or for both.

LE, L.E. abbreviation for "low explosive."

Lead (LEED) the distance ahead of a moving target that a gun must be aimed in order to hit it. See "swing-through leading."

Lead (LED) a metallic element, softest of the metals in general commercial use. It has a low tensile strength, is very malleable and melts at 621 degrees Fahrenheit. Used in making shot and bullets.

Lead azide (LED) a high explosive used in small quantities to set off other high explosives.

Leade, lede (LEED) the slightly enlarged and tapered portion of the bore of a gun barrel, just ahead of the chamber, sized to accept the bullet, which has a diameter greater than the bore. Also, frequently referred to as "throat." The terms "leade", "throat" and "freebore" pertain to the same portion of the bore. However, "leade" or "throat" refers to a taper-cut; free-boring is made with parallel sides rather than tapered.

Lead hammer See "soft hammers."

Leading (LED ing) lead deposited in the bore of a firearm upon the passage of lead bullets through it.

Leading (LEED ing) the act of aiming and shooting ahead of a moving target so that the path of the projectile will intercept that of the target. If successfully accomplished, both will arrive at a given point simultaneously.

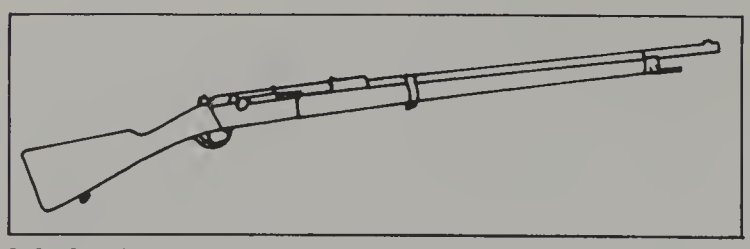
Lead shot See "drop shot", "shot", "chilled shot," "coated shot."

Lead table (LEED) a tabulation that furnishes the leads required in order to strike a moving target under various conditions, such as range, speed and direction of travel of the target.

Leaf sight a sight that is hinged at its base so it may normally be laid in a horizontal position but raised to a vertical position when required for sighting. Usually only employed for rear sights.

Leather an animal skin after removal of the hair and tanning. Used for belts, holsters, pouches, rifle boots, etc. The strength and elasticity of leather are much greater in moist air than in dry air.

Lebel revolver an 8mm, 6 chambered swing-out cylinder revolver (1892), formerly a standard French military sidearm but in use through World War II.

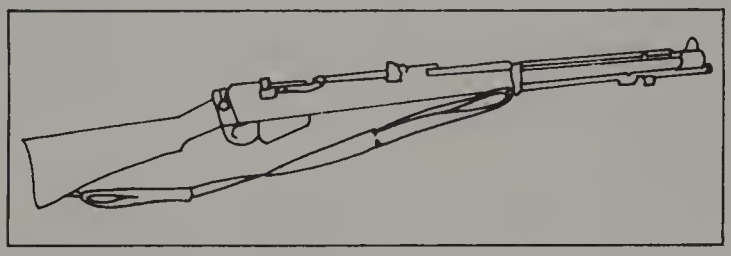


lebel rifle

Lebel rifle an 8mm, 8 shot tubular magazine military rifle produced in 1886 in France. The first bolt action rifle to use the new smokeless powder and used

as a standard by the French until 1936, and as a limited standard through World War II.

LeBourgeoys, Marin (circa 1550–1634) a French gunsmith and inventor. Reputed to have invented, in the years between 1610 and 1615, the first true flintlock, i.e., one having a battery and pan cover in one piece, the blow from the cock opening the pan and striking the spark.



lee-enfield

Lee-Enfield this name was first applied to a .303 caliber, 10 round, bolt action British military rifle adopted as the British service arm in 1895. It used the deep Enfield designed rifling to insure longer action of cordite. It replaced the shallow Metford grooving of the Lee-Metford rifle, which had been adopted as Britain's service rifle in 1888. The name has been associated ever since with the succession of British military models that followed.

Lee, James Paris (1831–1904) a Scottish born U.S. citizen who invented many firearms improvements while living in the United States and whose name is associated with the Lee-Enfield and Lee-Metford rifles, the latter officially adopted by Great Britain in 1888 as the Lee-Metford Magazine Rifle Mark 1. He designed the rifle known as the Lee rifle, made for the U.S. Navy in 1896.

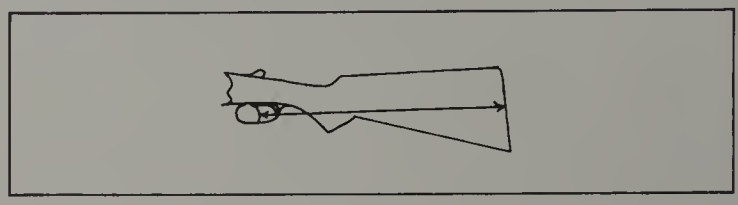
Lee-Metford the .303 caliber, 8 round, bolt action British military rifle adopted as the British service arm in 1888. It was succeeded as a service arm by the Lee-Enfield in 1895.

Leeward in the direction in which the wind blows. The opposite of windward.

Lefaucheux, M. a famous Parisian gunsmith who, in 1835, introduced the first truly successful breech loading cartridge and gun. The paper cartridge had a metal expanding base, a cardboard body and projecting brass pin and was termed a pin-fired cartridge. His son, Eugene G. Lefaucheux, patented a revolver in 1845 that became very popular throughout Europe in the 19th century.

Leman, Peter an American gunsmith who, as early as 1732, was producing rifled arms in the American Colonies, along with others of that time.

Lemon Squeezer the name commonly applied by gun collectors to the Smith & Wesson New Departure revolver, which has a squeezer grip type safety.



length of pull

Length of pull one of the measurements of a shoulder arm, namely the distance from the center of the trigger to the center of the butt.

Lens a piece of glass ground to concave or convex shape and used singly, or in combination with other lenses, to form an image by changing the direction of light rays.

Lens cap a removable protective covering for a lens.

Lenscoating a transparent coating of magnesium flouride, approximately one-quarter of a wave length of light in thickness (5 millionths of an inch) that is applied to optical lenses for the purpose of improving light-transmission properties. By reducing the amount of light that is normally lost through reflection, lens-coating can increase the light-transmission efficiency of an instrument by 30% or more.

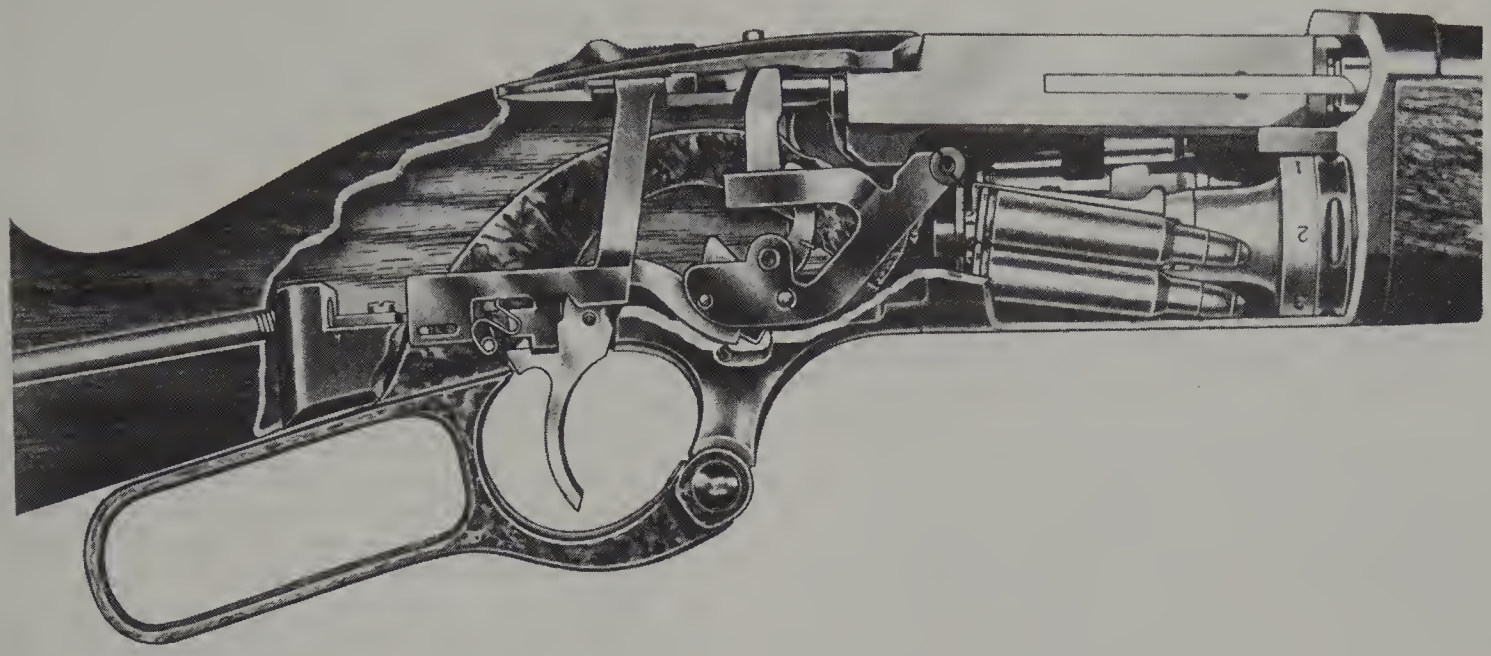
Lesmok the trademark for a blend of black and smokeless powder made by Winchester, consisting of 85 percent black powder and 15 percent gun-cotton and loaded into .22 rimfire cartridges.

Level the shortened term for a spirit level, an instrument by which a horizontal line or surface may be determined, used in most types of sighting and fire control equipment. The accuracy of a spirit level depends entirely upon the curvature of the glass tube. In expensive levels, this tube is ground on the inside to a barrel shape, the larger the radius of curvature, the greater the sensitivity. Nearly filled with ether or similar fluid, the tube is hermetically sealed at each end.

Level point the point in the downward curve of the trajectory where the projectile is level with the muzzle of the gun.

Lever a rigid piece that may be turned about a point or axis, called the fulcrum, to transmit force and motion.

Lever action that type of breechloading action using a lever beneath the grip to open the breech and at the same time extract a cartridge case and then, in closing the breech, to insert a fresh cartridge in the

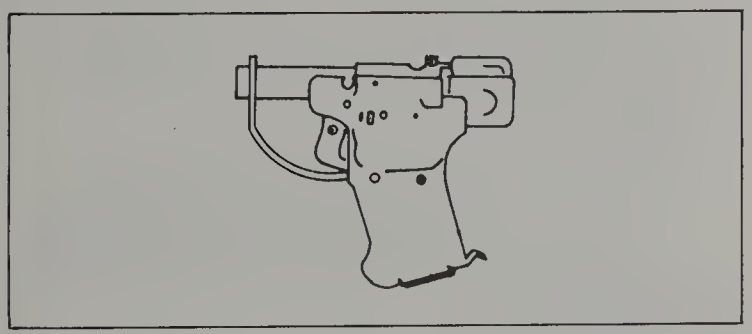


lever action

chamber. Used not only on certain rifles and shotguns but also on pistols.

Lewis the name of the light air-cooled, gas-operated machine gun with magazine mounted on top of the gun. The first prototype was developed by Colonel I.N. Lewis, U.S.A., in 1911, from a system invented by Samuel McClean. It has the distinction of being the first machine gun to be fired from an airplane, 1912.

Lewis, Isaac Newton (1858–1931) a U.S. Army Colonel who developed an improved version of the machine gun invented by Samuel Neal McClean. The Lewis version was used extensively by the British in World War I and by many other powers in World War II. Colonel Lewis is probably best known for his Depression Position Finder.



liberator pistol

Liberator pistol a cheap, easy to produce, single-shot .45 caliber pistol that weighed less than one pound and which was widely distributed to underground and resistance forces during World War II. It is estimated that over one million of these handguns were provided to those fighting against the axis.

Light gathering power the efficiency of an optical instrument in picking up and transmitting light rays; a factor that is wholly dependent upon the size and quality of the lens systems employed in a given instrument. On clear, sunny days, even the poorest grade of instrument will transmit a reasonably good image. Only under poor light conditions will differences in light gathering power become obvious to the user.

Light machine gun the .30 caliber, air cooled machine gun, and any machine gun smaller or lighter than this standard, is so classified by the U.S. military service.

Lignum vitae (lig NUMB VY-TEE) (latin for wood of life) an extremely hard and durable wood from a tropical American tree (Guaiacum Officinale) of the bean-caper family. Brown-black in color with yellow-green figuring, lignum vitae is occasionally used in making decorative fittings for gunstocks — such as forend tips and grip caps.

Limb work the crane of a revolver with components, upon which a swing out cylinder swings.

Limit of fire the boundary of the area in which gunfire can be delivered.

Linear magnification the ratio of the size of an image to the object.

Line engraving engraving consisting entirely of fine line or scroll patterns as opposed to engraving that is done in bas-relief.

Line in means to sight a target along the axis of the bore of the gun.

Line of bore the straight line which is the projection of the axis of the bore.

Line of departure the imaginary line which is the continuation of the axis of the bore of the gun the instant the projectile leaves the gun.

Line of fall the tangent to the trajectory of a projectile at that point in its downward curve when the projectile is at the same height as the muzzle of the gun.

Line of fire a straight imaginary horizontal line running from the muzzle of a gun in the same direction as a projectile fired from it.

Line of impact the tangent to the trajectory of a projectile at the point of its impact.

Line of sight the line along which the sights of a gun are set to place them in alignment with the shooter's eye.

Line of site an imaginary straight line extending from a gun or a position-finding instrument to a point, especially a target. Usually called "line of position."

Liner a rifled inner tube for a gun barrel that may be replaced when worn out. For shotguns, to permit use with a smaller gauge of shell, the tube is termed a "barrel insert" or simply, "insert."

Line shot the hit by a projectile on the imaginary line running from the observer to the target.

Line throwing gun a gun used for rescue operations, or in any situation requiring the throwing of a line from point to point. Usually a large caliber smoothbore shoulder gun, firing a heavy projectile out of the muzzle and to which a line is secured. A special blank cartridge propels the long projectile.

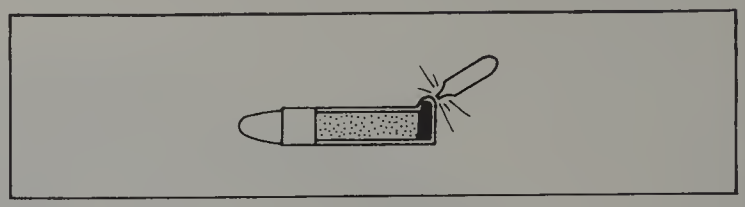
Link 1. a metal unit that connects the cartridges for automatic weapons and with them forms a feed belt. 2. a metal piece in a firearm that flexibly connects two parts.

Linkage a connection of two or more rods or strips to transmit motion in the mechanism of a gun.

Link belt an ammunition feed belt for an automatic weapon formed by links (most often of metal) that hold the cartridges and which comes apart or disintegrates as it feeds cartridges to the action of the gun.

Linseed oil a yellowish oil extracted from flaxseed, often used in gunstock finishes. Pure linseed oil does not dry well and must be mixed with a drying agent before it can be used in finishing work. See "Japan drier."

Lin-speed oil the trademark for a special gunstock finishing oil, having a linseed oil base, that is marketed by the George Bros. Co. of Great Barrington, Massachusetts.



lip fire

Lip fire an 1860 invention which provided a small lip which extended beyond the circumference of a cartridge case to contain a priming charge. Five years later, in 1865, the Crispin cartridge improved upon the idea by offering a primer-containing rim that completely encircled the head of the case. This was the forerunner for rimfire shells that are made to this date.

Lippershey, Hans a Dutch optician who, in October of 1608, applied for a patent on his telescope, but the Dutch authorities refused to grant one for "military reasons." He is recognized as the first inventor of the telescope.

Liquid oxygen explosive known as L.O.X., is an explosive found useful in quarrying and mining operations. It is chemically a departure from the conventional type of explosives in that it consists of a mixture of very finely divided carbon, in the form of lampblack or carbon black, with liquid oxygen whose combustion is initiated by a fuse or a detonator. It is considered a safe and stable explosive for commercial use.

Lithium soap a name commonly applied to lithium stearate, which is used as a thickener for lubricating greases generally serving an all-purpose use and having high water and high temperature resistance as well as good low temperature properties.

Live load a round of ammunition containing an explosive as contrasted with "drill" or "dummy ammunition" which is inert, having no explosive.

Load a single round of ammunition. Also means to place a round in a gun.

Loading, density of See "density of loading."

loading gate

Loading gate a hinged cover for a magazine or breech to close it, except for loading or unloading. In a revolver having a cylinder that does not move away from the breech for loading, it refers to a hinged portion of the standing breech that swings out to expose one of the chambers of the cylinder for loading or unloading.

Loading port any form of opening provided by the design of a given firearm to permit loading of the magazine or chamber.

Loading ramp the platform in a single-shot weapon upon which the cartridge is placed prior to chambering.

Loading tray a hollowed slide which guides the ammunition into the breech of some types of automatic weapons. It also refers to a carrier for heavy projectiles to more readily place them into the breech of a cannon.

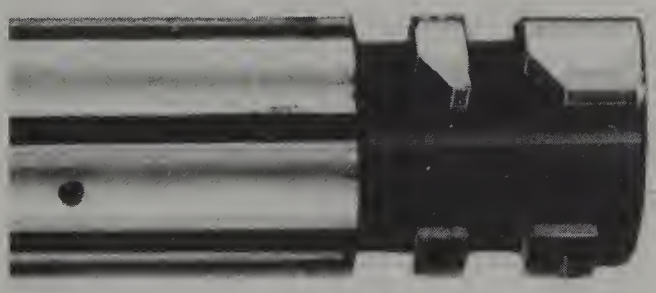
Load pistol command to insert a loaded magazine in a pistol.

Lock 1. to make a loaded gun safe by setting its safety. It also means the position of the safety mechanism that prevents a loaded gun from being fired. 2. the firing mechanism of a muzzleloader. In a breech loader, usually the firing mechanism together with the breech sealing assembly. 3. a device or part for locking two parts together, such as a "locking lug."

Lock energy the energy of the striker or firing pin blow delivered to the priming mixture.

Lock frame a component of certain firearms used to cushion the shock of recoil of the barrel and bolt assembly before the bolt is unlocked and opened.

Locking cam a movable cam located in the gun to engage mated locking surfaces to seal the breech.



locking lugs

Locking lug a projection from the bolt which engages with the receiver so that when the gun is fired the bolt is held against the barrel to seal the breech. Some autoloading firearms have locking lugs on the barrel and slide to lock both together at the instant of firing.

Lock plate a metal plate secured to the stock of a gun for mounting the firing mechanism. Also a plate that is removable to give access, as in a revolver, to the firing mechanism.

Lock, stock and barrel the sole components of early hand firearms which constituted a complete gun. It has come to mean completeness of anything to which the phrase is applied.

Lock time the interval of time between the instant the final pressure has been completed to release the trigger and the instant the priming mixture detonates. In that time interval the trigger and sear movements have released the firing pin, the firing pin has been impelled forward striking the primer and the priming mixture has been crushed. Tests with modern ammunition and firearms showed lock time to be in the neighborhood of from .0022 to .0057 of a second.

Lockwork See "action."

long eye-relief scope

Long eye-relief scope a form of scope sight designed to focus the exit pupil a considerable distance behind the eyepiece lens, so that the scope can be mounted forward of the action area on top-ejecting firearms or, on a handgun, which is generally held at arm's length.

Long fowler a smooth bore muzzleloading shoulder gun having an unusually long barrel that, in some cases, reached 6½ feet.

Long gun a term applied to long barrelled firearms to distinguish them from short arms, i.e., pistols and revolvers.

Longitudinal deviation See "range deviation."

Long recoil action a locked breech system using recoil of bolt and slidable barrel to eject a fired case and reload a semiautomatic pistol, rifle or shotgun. The breech bolt and barrel, while locked, move rearward together the full recoil stroke, a distance greater than the length of the cartridge used. There the bolt is held back while the barrel under its own return spring begins its forward movement. Enroute to its original position, the barrel enables the fired case to be ejected and trips a lever that lets the bolt come forward under its return spring, thereby loading another cartridge. While this system is reliable and has been in use for about fifty years, the added impact of both bolt and barrel in recoil may cause discomfort to the shooter.

Long rifle historically a long-barrelled, relatively lightweight flintlock such as the Kentucky Rifle. In referring to a cartridge, the .22 caliber long rifle cartridge.

Loop sling adjustment a deliberate method for adjusting the sling strap on a rifle so that it fits the arm of the shooter tightly to steady the rifle while shooting. For a right handed shooter, the left arm is passed through a loop in the upper strap, which is subsequently tightened around a point over the elbow, to suit the individual. See "hasty sling adjustment."

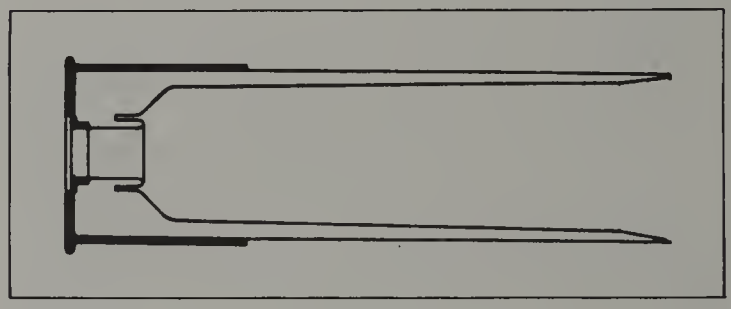
Loose round a defective cartridge having a bullet that is loose in the case. The term also has its conventional meaning, i.e., a round not contained in a clip, magazine or other cartridge feeding holder or device.

Lorenzoni repeating system the name used to identify a firearms system that made its appearance in the mid-17th century, a form of which was made by Michele Lorenzoni of Florence, Italy. This system was used with various modifications in the 17th and 18th centuries and even into the 19th century. The early embodiment consisted in having two magazines in the butt of the stock, one for powder the other for ball. By manipulating the gun and a lever, successive loadings of ball and powder could be made from the magazines.

Lost in clay target shooting, a term used to describe a target that has either been missed completely or only "dusted." Scored as a miss.

Lost wax process refers to a method of casting metals believed to have been first used by the Egyptians. The process consists of modelling the specimen in wax, fastening the wax specimen to a wax "casting tree" and placing the entire "tree" (containing many specimens) into a container, where it is thoroughly sprayed with a liquid refractory agent. The refractory material hardens quickly and more liquid "cement" is added to the container to fill it. The entire container is then placed in an oven and heated. The "cement" hardens and the wax elements melt, leaving behind cavities of the exact size and shape sought. When the melted wax is withdrawn, it is replaced by molten metal, poured through the sprue hole of the "tree." Various metals in powder form may be blended, melted and poured into the mould to create the desired alloy. After cooling, the mould is broken open, segments detached from the "tree," and the product cleaned up, or polished, for use in the finished assembly. See "investment casting."

Lot, lot number a quantity of ammunition having the same properties as the result of manufacture by the same manufacturer with the same ingredients at the same time under like conditions. Each such lot is assigned a number or other identification called an "ammunition lot number."



low base

Low base a wad of low height fitted into the base of the paper tube of a shotshell. With the advent of plastic shotshells, some have plastic wads integral with the one piece tube and base. To distinguish this term, see "high base," "low brass" and "high brass."

Low brass the outer brass head of a shotshell casing that extends but a short way up the side of the case. Generally used with black or bulk powder in light to moderate loads, it gives no real indication of the height of the inner base wad. The term is often used erroneously when referring to "high base" or "low base" loads. Base wad dimensions can only be determined by measurements taken inside the case.

Low explosive a relatively slow burning explosive, usually set off by heat or friction, employed for propellent charges. Abbreviated as LE or L.E.

Low mould, low mold a form of regional jargon used to refer to buckshot of small size.

Low order detonation incomplete and comparatively slow explosion of the burster of an explosive projectile.

Low power cartridge a cartridge producing a muzzle velocity of less than 1850 feet per second.

LR abbreviation for long rifle.

Lubaloy a trademark of Western Cartridge Company for bullets jacketed with gilding metal (usually 90% copper and 10% zinc) with a small percentage of tin added.

Lubricant a substance, such as oil or grease, to reduce friction between moving parts like those in the actions of firearms. So called lubricated bullets are those lead bullets lightly coated with grease or those given a copper wash.

Lubricant, cold weather in cold weather, the usual oils will congeal and often make the breech mechanism inoperative at low temperatures. For extremely cold weather protection, all traces of oil should be removed from the mechanism and finely powdered graphite used as a lubricant. With some mechansims, like a bolt action rifle, where lubrication is not a critical factor, the weapon is best left dry, without any form of lubrication.

Lug an earlike projection. Typical is the locking lug on the barrel of a shotgun.

Luger the registered trademark of Stoeger Arms Corporation for an automatic pistol having a toggle locked breech known in Europe as the Parabellum pistol. From 1908 until 1938, the 9mm Parabellum was the official military sidearm of Germany. The Swiss Army adopted it as an official sidearm in 1900, in caliber 7.65mm. When, in 1948, it was replaced in the Swiss Army, it ended a 48 year period of use as an official military sidearm.

Luger, Georg (1848–1922) LEW ger a German engineer who, with Ludwig Loewe, a Berlin manufacturing firm, in 1900, patented an automatic toggle locked breech, automatic pistol, (an improved model over the Borchardt design) called the Pistole Parabellum Model 1900, and later sold in the United States under the trademark Luger.

Lumps the British term for "lugs." See "lug."

Lyman the trademark for shooting accessories made by the Lyman Gun Sight Company of Middlefield, Connecticut, known for their sights, scopes, chokes, bullet-casting equipment and reloading tools.

M

M effective April 11, 1922, the official nomenclature for U.S. Army ordnance items included model designation by use of the letter "M" followed by the year of adoption of the item as a standard. Alterations, if any, were shown by adding the letter "M" and a Roman numeral after the year. The present system, adopted July 1, 1925, uses the "M" followed by an Arabic numeral. The complete item description of the Garand rifle is "U.S. Rifle, Cal. .30 Ml." Alterations to the basic model are shown by adding the letter "A" followed by an Arabic numeral indicating the first, second, or other succeeding alteration. For example, the first alteration is shown in the description of the arm, as "U.S. Carbine, Cal. .30, M1A1." The system applies to ammunition as well as all other ordnance items.

M1 ammo a term sometimes loosely used for ammunition for the M1 rifle or the M1 carbine. While both these U.S. military weapons are essentially .30 caliber, there is a great difference between the shells that are used in the M1 rifle and those used in the M1 carbine. For this reason, it is necessary to differentiate between M1 rifle and M1 carbine ammunition.

M1 carbine a light small and popular weapon of World War II, the U.S. Carbine, Caliber .30, M1, gas-operated semiautomatic carbine. This weapon uses a short .30 caliber cartridge with a bullet that weighs 110 grains (with metal jacket). Muzzle velocity is about 1900 f.p.s., muzzle energy approximately 900 foot-pounds. Overall weight of carbine is 5½ lbs. with sling, oiler and empty 15 round magazine. The M1A1 has a folding stock. A later version, called the M2, was made with some modifications so that it could be used as a fully automatic weapon. A selector lever, located at the top left of the receiver, adjusts the weapon for semiautomatic or fully automatic fire.

M1 rifle the standard U.S. infantry weapon of World War II, the U.S. Rifle, Caliber .30 M1, popularly known as the Garand rifle. Gas operated and semiautomatic with an 8 round capacity clip fed magazine. Weight from 9¼ to 9½ lbs. and, with bayonet, one pound more. Overall length 43.6 inches. Since replaced by the M14, in NATO caliber 7.62mm.

M14 Rifle the U.S. Rifle, 7.62mm, M14, adopted as a standard U.S. Army Rifle in June 1957. It is an air-

cooled, gas-operated rifle, caliber 7.62mm and, although designed primarily for semi-automatic fire, may be fired either semi-automatically or automatically from a 20-round detachable box magazine, which may be loaded from 5-round clips while attached to the rifle or by use of a magazine filler when detached from the rifle. The barrel has a flash suppressor and may be supported by a bipod. It has an adjustable rear sight calibrated in meters, one click of elevation or windage moving the strike of the bullet .7 centimeters at 25 meters. It replaced the M1 rifle, Browning Automatic Rifle, M2 caliber .30 carbine, and the M3A1 caliber .45 submachine gun. Loaded it weighs 11¼ pounds. It fires NATO 7.62mm cartridges of various types. The 150 grain ball bullet has a muzzle velocity of 2,800 fps and a maximum effective firing range of 700 meters (765 yards) with bipod, and an extreme range of 3,725 meters (4,074 yards). It can also fire the M198 Duplex Cartridge which has two bullets seated in one cartridge case.

M14A1 Rifle the U.S. Rifle, 7.62mm, M14A1, is a modification of the M14 and, although capable of both semiautomatic and automatic fire, is designed primarily for automatic fire. It differs from the M14 by having a stabilizer assembly, modified bipod, front and rear hand grip, straight line stock, different sling swivel mountings, longer sling, and a rubber recoil pad. Loaded, it weighs 14½ pounds.

M16A1 Rifle the U.S. Rifle, 5.56mm, M16A1, an air-cooled, gas-operated rifle, caliber 5.56mm (.219"), the U.S. Army version of the AR-15 originally developed by Armalite and initially manufactured by Colt's, Inc. It fires semi-automatic or automatic from a 20-round removable box magazine. The barrel is provided with a flash suppressor and may serve as a grenade launcher and front support for a bayonet. It has an adjustable front sight and an adjustable rear sight which is part of the carrying handle and is calibrated in meters. Fully loaded, but without bayonet and bipod, it weights 7.6 pounds. Its 55 grain bullet has a muzzle velocity of 991 meters per second (3,250 fps) and a maximum effective range of 460 meters (503 yards). The appearance and ballistics of its cartridge resemble those of the .222 Remington Magnum.

Machine 1. a combination of parts to transmit force and motion to produce a desired result, thus the term is applied to a continuous firing gun as a machine gun. 2. to do work upon a substance with a machine, such as planing, milling, turning, etc.

Machine gun a firearm of .50 caliber or less in U.S. military service, capable of rapid automatic fire for sustained periods of time; usually fired from a

machine rest

mount. It may have any of the following features: belt fed or magazine fed, water cooled or air cooled, recoil operated or gas operated.

Machine rest a mechanical support for a firearm that holds it steady in a predetermined position even when the trigger is squeezed. Used extensively in firearms testing.

Machine tool a non-portable power driven metal working machine having one or more tool and work holding devices used for the removal of metal. Included in this definition are milling, honing, lapping machines and grinders.

Machining the process of removing metal from a piece by the use of a machine tool.

Magazine 1. a container for cartridges which has in it a spring and follower to feed cartridges into the chamber. It may be a separate piece to be inserted into the gun or an integral part of the gun. 2. a place for the storage of powder, ammunition or explosives.

Magazine, blind box See "blind box magazine."

Magazine, box See "box magazine."

Magazine catch the device that holds the magazine in place in a rifle or pistol.

Magazine, clip See "cartridge clip."

Magazine, drum See "drum."

Magazine fed a means of supplying a firearm with ammunition. A magazine containing cartridges is attached to or inserted into a repeating firearm. For example, an automatic rifle is magazine fed.

Magazine follower See "follower."

Magazine gun the name given to a rifle or carbine having a magazine — sometimes called a repeating rifle or carbine.

Magazine platform the British term for follower.

Magazine plug a wood or metal filler for tubular magazine guns that is used to reduce overall magazine capacity. The Federal Migratory Bird Law requires that repeating shotguns be limited to a total capacity of three shells (counting the one shell in the chamber). For this reason, guns that have larger capacities must be fitted with "magazine plugs."

Magazine pocket a container of leather or other tough material worn on a cartridge belt by which cartridge filled magazines may be carried on the person.

Magazine, rotary See "rotary magazine."

Magazine tube See "tubular magazine."

Magazine weapon a firearm that has a magazine feed. For example, the Browning automatic rifle.

"Maggie's drawers" a slang expression referring to the red target-marker's flag when it is waved back and forth in front of a target to indicate to the shooter that he missed the target completely.

Magna grip a particular type of grip made by Smith & Wesson that is larger and more hand-filling than a conventional grip.

Magnifying power in an optical instrument is the ratio of the apparent size of an object as seen through the instrument to the apparent size of the same object seen without an instrument. In telescopes having a positive eye-piece, the magnifying power is equal to the ratio of the focal length of the object glass to the focal length of the eyepiece. While high power increases the apparent size of any object, it decreases illumination and the size of the field, and makes focusing more difficult.

Magnum a word of British origin denoting a cartridge of higher than ordinary velocities.

Mahogany (L. Meliaceae) hardwood that is yielded by the tropical American or Philippine mahogany tree. Rarely used in stock-making because of its uninteresting grain and heavy weight.

Mainspring the spring that activates hammer or striker and, thus, the firing pin when the stored up energy in it is released by squeezing the trigger.

Malfunction failure to perform properly. A malfunction may occur in the action of a gun, causing a stoppage, or may occur in ammunition.

Mallet a short heavy hammer of metal or wood. When of wood it is used in gunsmithing as a "soft hammer."

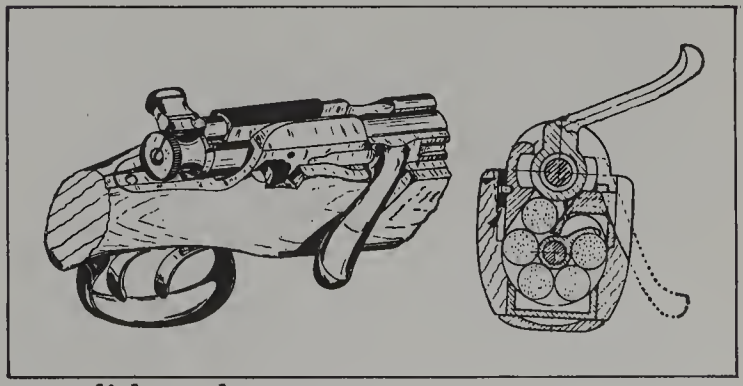
Mandrel, mandril a metal spindle or bar that is inserted into a part or piece to be machined or turned on a lathe.

Manganese is red tinged, grayish-white, heavy, hard and brittle metal element whose chemical symbol is Mn. It is used in the manufacture of manganese steel and, depending on use, the content of manganese in the steel is varied accordingly.

Mangonel a military stone-throwing engine of the 14th century.

Mannlicher the name under which most of von Mannlicher's firearms designs are known. The most widely known military rifle is the straight pull action of 1895.

Mannlicher, Ferdinand Ritter von (1848-1903) a German born Austrian engineer and inventor, whose name is given to a rifle stock extending all the way to the muzzle, although he did not develop it. He was a



mannlicher-schoenauer

prolific designer of firearms. The name still continues today on certain firearms made in Austria.

Mannlicher-Schoenauer the rifle now known by this name embraces the design brought out by von Mannlicher in 1887, with turn bolt lock, spool magazine for single shot or clip loading, and with a release for quickly emptying the magazine of cartridges. Sporting models under this name are manufactured in Austria and sold in the United States.

Mann "V" Rest a machine rest designed by Dr. Franklin W. Mann, characterized by having a heavy block of steel giving an accurately machined deep "V" slot in its top surface. It is used with a Mann barrel of heavy weight and design, chambered for the cartridge to be tested.

Manometer an instrument for measuring the pressure of gasses or vapors.

Manton, Joseph (1766-1835) an English gunsmith and inventor who, with his brother John, were famous London gunmakers. He patented a percussion pellet lock in 1816 and a tube lock in 1818. His elevated rib for sighting double barrelled guns and a patented breech are his best known inventions.

Manual of arms the prescribed military exercises and drill in the handling of firearms.

Marathon a trap or skeet shoot which calls for the shooting of 500 or more targets in one day.

Marathon shoot common to skeet and trap shooting — an event that calls for the shooting of from 500 to 1,000 targets in a single day.

Marker the individual who marks the targets in target practice. It also means a person, stake or other object that defines a point or boundary line in target practice.

Marking disk a colored disk at the end of a long pole by which an individual in a target pit may indicate to a shooter the location of his hit or value of his score.

Markings the words and abbreviations found on firearms which may, in addition to designating origin, describe model, material, type of use, etc.

Mark, M. a system of model numbers to identify the design of equipment was adopted in the U.S. military service in 1925, replacing a system of letters and symbols. The number is preceded by the word Mark or simply by the initial M. For example, the first Garand rifle of standard issue is designated "U.S. Rifle Caliber .30, M1." A change in the design of the basic model would be shown as "M1, A1"; "M1, A2"; etc.

Mark, Mk prior to World War I the official nomenclature for U.S. Army ordnance items included model designation by use of the words "Model of" followed by the year the model was adopted as a standard. Subsequently the word "Mark", or its abbreviation "Mk" followed by a Roman numeral was used. This coding was adopted from the system used by the British and the U.S. Navy. This system was replaced April 11, 1922, with one that used the letter "M", described herein under "M."

Marks grip insignia or legend on gun grips to indicate manufacturer. See "escutcheon."

Marksman in the U.S. military service the lowest classification given for skill in the use of small arms. It also is the word applied to one who holds such classification. See "qualification in arms."

Marks, proof See "proof marks."

Marksmanship skill in shooting.

Marking flag a flag used to indicate that a range is in use, or that a danger exists, or to designate a point or limit to an area used for target practice.

Marking pennant a triangular flag used to indicate a danger or other point, or limit, to an area generally used for target practice. May also be used to identify other needs for caution.

Mark target the order given to a designated individual called a "marker" to mark the shot on the target.

Marlin a trademark for firearms made by the Marlin Firearms Company (Inc.) founded in 1870. When a machine gun was required by the United States for World War I the company speedily developed one that was also known by the name of Marlin.

Marlin, John Mahlon (1836-1901) an American inventor and firearms manufacturer who founded the predecessor company, whose name still is perpetuated in the present day Marlin Firearms Co.

Martin an early type of centerfire metallic cartridge in which the primer cup was formed as an integral part of the case head.

Martini the rifle designed by Frederick von Martini for Switzerland was a drastic modification of the Peabody, one feature of special note being a completely internal firing lock, within the breech-block, that replaced the high hammer of the flintlocks. England made a modification and used its Henry barrel, thus creating the Martini-Henry rifle officially adopted by the British in 1871.

Martini, Frederick von Swiss inventor of the now famous Martini firing mechanism, operated by a lever to the rear of the trigger guard. Combined with Alexander Henry's system of rifling, it became the Martini-Henry rifle adopted in 1871 for the British Army.

Martini-Henry a .45 caliber rifle officially adopted in 1871 by the British, which combined the Martini firing mechanism and the English Henry system. Modified to .303 caliber was used for Home Guard Service by the British during World War II. The Martini-Henry was replaced by the Lee-Metford in 1891.

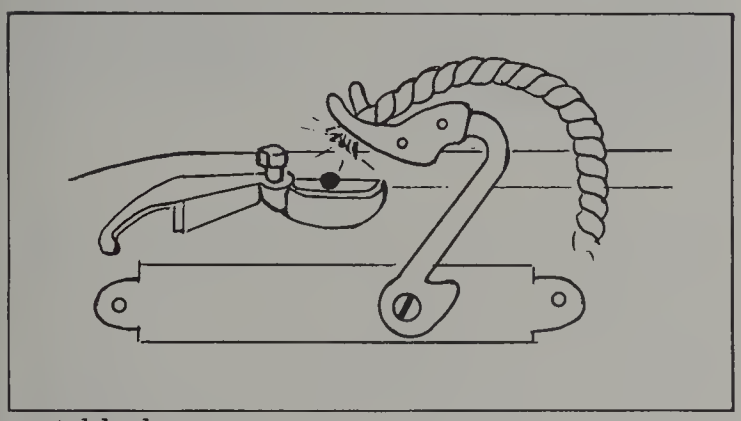
Master gages are gages used for verifying inspection

gages or for checking questioned parts. Also known as "check" and "reference" gages.

Match the term applied to a slow burning cord used by the cannoneers and musketeers in the matchlock era. See "quick match" and "slow match."

Matchbox a perforated tube of metal, about a foot in length, in which a cannoneer or musketeer could carry a lighted match to protect it from the weather and conceal it from sight.

Match-grade ammunition ammunition made for match use, precision loaded to lower velocity levels than the regular or high speed cartridges ordinarily used in sporting rifles.



matchlock

Matchlock a firearm ignition system using a slow match in a holder that could be brought to bear on the priming powder to ignite it by the heat of the burning match. Earliest record of use is 1411.

Matchlock arms in addition to being equipped with the matchlock ignition system, matchlock arms were produced over the years with many other design innovations, such as: grooved (rifled) bores in straight and spiral patterns, interchangeable barrels, sights, breech loading mechanisms, multiple barrels, revolving cylinders and repeating fire features.

Matting the roughing of a metal surface designed to reduce reflections and glare. Matting is commonly found on the top surface of a rib and consists of stipling or a mechanically cut pattern.

Mauser (MAU zer) the registered trademark of Mauser-Werke Aktiengesellschaft for firearms and other assorted products made in Germany. The first successful military bolt action rifle firing a metallic cartridge was designed in 1871 by Peter Paul Mauser and subsequently adopted by the German Army in 1872. In a tubular magazine repeating rifle. Later, a five-round box magazine rifle was also produced.

Mauser, Peter Paul (1834-1914) MAU ser a German gunsmith, inventor of the first successful metallic cartridge bolt action rifle, a patent for which action was taken out first in the United States in 1868. Listed in the patent as co-inventors with him are his brother, Wilhelm, and Samuel Norris, an American. The name Mauser is connected not only with rifles but with pistols and revolvers.

Mauser Werke the famous German firearms manufacturing plant located in Oberndorf, Wuerttemberg, West Germany. The huge mile-long plant was destroyed after World War II under the Level of Industry Plan, issued March 28, 1946, by the Allied Control Council. A few small buildings considered unsuited to firearms production were exempted. Dismantling of specified plants in Germany was officially terminated by the Allies in 1951. The present company, Mauser-Werke Aktengesellschaft, resumed manufacturing by the production of machinists aids, and, in recent years has resumed the manufacture of sporting firearms.

Mauser, Wilhelm a German gunsmith, brother of Peter Paul, and co-inventor with him of the bolt action bearing the name Mauser.

Maxim the name applied to guns invented by Hiram S. Maxim, known as the father of modern automatic firearms. The basic patent was granted in 1884 by the United States. Maxim guns were first issued to British forces in 1891 and received their combat trials in 1893-94 in Africa. They rapidly replaced the Gatling guns.

Maxim, Hiram Percy (1869-1936) the American son of Hiram Stevens Maxim, but known for his invention of the Maxim silencer, the manufacture of which was discontinued in 1925.

Maxim, Hiram Stevens (1840-1916) a prolific designer and inventor of firearms who was born in the U.S. but chose to migrate to England in 1882, and who subsequently obtained British citizenship. Brother of Hudson Maxim. Best known as the father of automatic weapons as they are known today. Experiments in 1881 and 1883 produced the first practical system for semi-automatic operation of a rifle. His first order for a test lot of three machine guns was given him by the British government in 1887.

Maxim, Hudson (1855-1927) an inventor of improvements in explosives. Born in the U.S., but for two years (1886-1888)) joined his brother, Hiram Stevens Maxim, in England.

Maximum ordinate the difference in altitude between the muzzle of a gun and the highest point in the path of its projectile when in flight.

Maximum range the greatest distance a gun with given ammunition can fire.

Maynard the name for a breech loading rifle invented

in 1851 by Edward Maynard, dentist and inventor, that used a percussion cap and a freak brass cartridge case. Its mechanical system later was used when the true metallic cartridge was introduced. The name was also applied to carbines using Maynard's invention.

Maynard, Edward (1813–1891) an American dentist and inventor. In 1845 he patented the tape primer which was, in 1855, adopted for official U.S. military weapons. In 1851 he invented an improvement in breech loading rifles which was incorporated in what came to be known as the Maynard rifles and carbines. Other inventions in firearms were also made by him.

Maynard primer a form of percussion cap having pellets held at spaced intervals between two strips of paper. Also called a "tape primer."

MC abbreviation for "metal case," in referring to a bullet.

McClean, Samuel Neal an American gunsmith, inventor of the machine gun made famous by Colonel I.N. Lewis, who, after 1910, made improvements in the original design and promoted its manufacture and acceptance by military authorities. The gun is known as the Lewis machine gun.

ME abbreviation for "muzzle energy."

Mean deviation the average distance by which a group of shots fired from the same gun, with the same firing data, misses the target.

Mean error the average distance by which a group of shots fired from the same gun, with the same firing data, lie from the center of impact.

Mean radius the average radius of a group of shots from the center of the group.

Mean range the average distance from the gun reached by a group of shots fired from it with the same firing data.

Mean trajectory the trajectory that passes through the center of impact.

Measurements measurements of firearms parts and cartridges are in the English system normally made to .001". In the metric system to .01 of a millimeter, which is the equivalent of .00039".

Medium fire a military term for a moderate rate of fire as, for example, for a Browning machine gun about 15 bursts of from 6 to 8 rounds each per minute.

Meet a gathering or assembly for a sporting event such as the annual shooting contest called the "National Matches" at Camp Perry, Ohio.

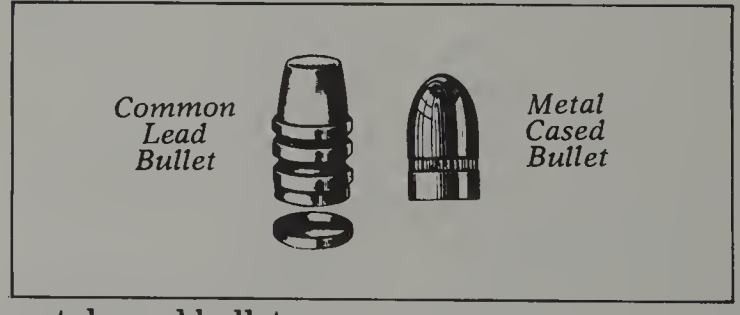
Melting pot the simple cast-iron pot used for lead melting purposes since the fifteenth century and still employed by some today. Elaborate electrical and thermostatically controlled modern pots are really "casting furnaces" but are invariably called "melting pots" too.

melting pot

Mercury a heavy metallic chemical element in a liquid state at ordinary temperatures, popularly called quicksilver.

Mercury fulminate a sensitive explosive that is set off by friction, impact or heat and burns at a very rapid rate. Used to set off other explosives. Chemically it is mercuric isocyanate, made by treating mercuric nitrate with alcohol.

Mercury hardening the practice of hardening steel tools and parts by heating and quenching in liquid mercury. Although this is a quick and efficient hardening process, the high cost of mercury generally limits its application to very small components such as drill bits, taps, etc.



metal cased bullet

Metal cased bullet lead core encased in a jacket of harder metal. The jacket may be of brass, copper, cupro-nickel, gilding metal, steel or other metal harder than the lead of the core. Jacketed bullets give increased penetration and greater uniformity of performance and, while particles of the jacket metal may

be stripped off, lead fouling is eliminated. To reduce barrel wear or to protect the jacket from corrosion while in storage, the jacket is often plated or given a thin metallic wash, such as with copper.

Metal cased hollow point bullet a lead core encased in a jacket of harder metal except at the nose. A cavity is formed in the exposed nose of the lead core. The purpose of this construction is to give maximum expansion on impact without shattering the bullet.

Metal coating may be given a metal by electroplating, spraying or oxidizing. Metal spraying is accomplished by spraying atomized molten metal by compressed air upon the surface to be coated.

Metal fatigue See "fatigue."

Metal fouling bits of metal that collect in the bore of a gun, coming from the projectiles passing through it. Seldom encountered today when modern jacketed bullets are used.

Metal jacketed bullet another name for a metal cased bullet.

Metallic ammunition ammunition made up in rounds, mainly for rifles and handguns, the cases being made of brass, copper or mild steel and the projectiles also being made of metal. A term applied to rifle and pistol ammunition by the firearms industry to differentiate between ammo made for rifles and pistols and that which is made for shotguns — the latter consisting largely of cases that are made from paper or plastic. Sometimes referred to merely as "metallics."

Metallic sight a non-optical sighting system for aiming a gun. Frequently referred to as an "iron sight." See "optical sight" and "sight."

Metallurgy that science that deals with the properties of metals and their separation from their ores. For many years, Watertown Arsenal's researchers in metals used in the manufacture of cannon contributed greatly to metallurgical knowledge.

Metal patched bullet generally refers to any bullet partially or fully encased in a metal jacket. Technically, with few exceptions, it is a lead or lead alloy bullet seated in a cup of harder metal that extends up the side of the bullet, leaving the nose uncovered. The term "metal patched" is a carry-over from the days when a non-metallic patch was used around lead bullets as a gas seal and to engage the rifling. If the bullet is fully covered, technically it is a full-metal patched bullet.

Metals, melting points of See Appendix.

Metals, properties of most commonly used in gunsmithing are listed in the Appendix.

Meter 1. an instrument for measuring, especially one to measure the flow of air, gas, water or electricity. 2. the principal unit of length in the metric system, equal to 39.37 inches. When calibers are given in the metric system, the millimeter, equal to 1/100 of a meter, is used as the unit of measure.

Metford rifling system a form of rifling having slightly rounded shallow grooves and lands, used extensively in English rifles during the black powder days.

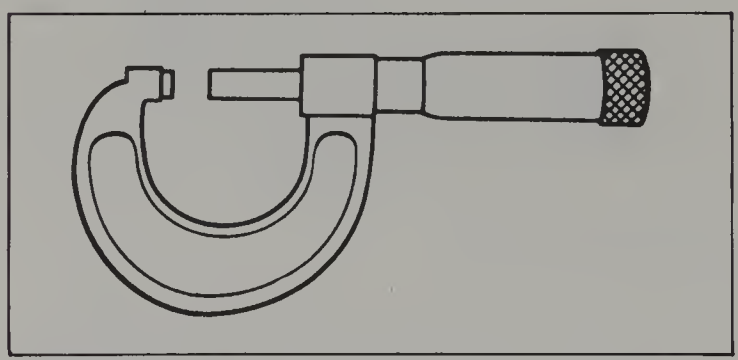
Metford, William Ellis (1824–1899) an English engineer, who, in 1865, developed the Metford rifling system of seven grooves, which was combined with the bolt action of James P. Lee in the Lee-Metford magazine rifle in 1888. This was the first magazine rifle issued to the British Army (1889), later to be replaced in 1895 by the Lee-Enfield rifle.

Metric system a system of measurement using the meter as the principal unit of length, the liter for capacity, and the gram for weight. All subdivisions and multiples in the system are decimal. The system originated in 1791 in France. Since 1950, the U.S. Army has used milimeters to designate newly developed weapons and ammunition. See Appendix for equivalents in the English system of measurement.

Metro correction a contraction of "meteorological correction." The adjustment made in the firing data of a gun to allow for wind, air pressure, etc., affecting the flight of a projectile, especially one fired from a cannon.

Mexican rosewood See "rosewood."

Micro-bed an epoxy bedding compound used in rifle accurizing work, manufactured and distributed by the Micro Sight Company of Belmont, California.



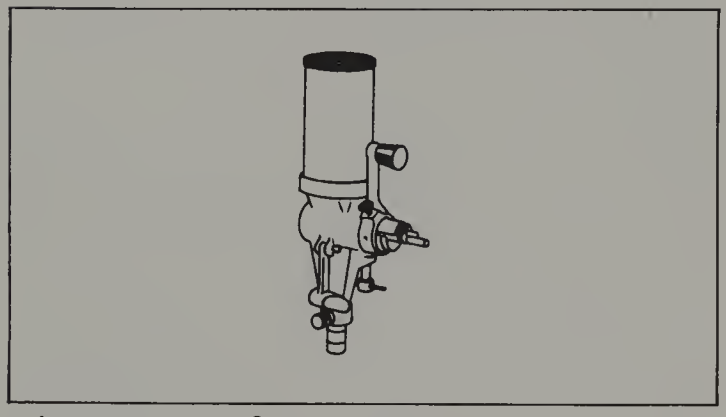
micrometer

Micrometer a precision measuring instrument designed to measure in thousands (.001") of an inch and essential to the work of a gunsmith.

Micrometer caliper a caliper with a micrometer screw attached, a precision measuring instrument for measuring in thousandths (.001) or ten-thousandths (.0001) of an inch. Generally referred to simply as a "micrometer" or "mike."

Micrometer powder measure a powder measuring tool consisting of a powder storage hopper, an adjust-

able volumetric measuring reservoir, and a drop tube. Powder measuring tools of this type measure by *volume*; for safe and accurate handloading purposes, powder charges must be determined by weight. When used in conjunction with a grain-scale, volumetric powder measures can be adjusted to measure charges with reasonable accuracy and greatly speed-up the handloading process.



micrometer powder measure

micrometer sight

Micrometer sight an adjustable aperture type receiver sight equipped with micrometer-like devices to permit-fine adjustments, for windage and elevation, in the position of the aperture.

Micrometer telescope mount a form of telescope mount used with fixed-reticle target scopes that provides external micrometer adjustment devices (in the mount rather than in the scope) for windage and elevation.

Micro photograph a very small photograph or one taken through a microscope, such as those taken of bore surfaces, fired bullets, and fired cartridge cases for study.

Microscope an optical instrument for examining minute objects to magnify them for the eye. An essential instrument in the identification of firearms. See "comparison microscope."

Middle sight in the broadest sense, a middle sight is any sighting apparatus that is located approximately halfway between the muzzle and the rearmost surface of the receiver. Target shotguns (used for skeet or trap shooting) have — in addition to a bead at the muzzle — a smaller bead (called a middle sight) about 14-inches behind the muzzle sight. In rifles, an open sight located on the barrel, between the front sight and an aperture type receiver sight, would be properly called a middle sight.

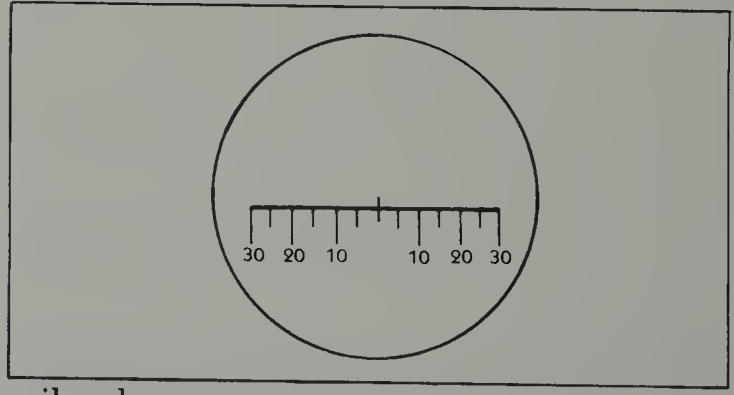
Mid-range that point in a trajectory that is halfway between the muzzle of a gun and the target.

Mil an angular unit of measure used in the U.S. Army and intended to be an angle that is subtended by one unit of length at a distance of 1000 units of length. Thus, a mil subtends 1 foot at a distance of 1000 feet. To precisely do so, the mil should be 1/6283 of a circle. The mil formerly used by the infantry was 1/6280 of a circle. The artillery mil now used throughout the Army is 1/6400 of a circle and has the advantage of having a denominator capable of division into whole numbers. For practical purposes, it represents 1/1000 of the range. One mil equals 3'22.5" or, in fractions, 3.375 minutes. One degree of angle equals 17.8 mils. Civilian firearms users employ minute of angle rather than mils for adjustment of fire.

Mile the English unit of distance, equal to 5280 feet or 1,609.3 meters, in the metric system.

Millimeter a unit of measure of length in the metric system equal to .03907 inches. Abbreviated "mm."

Mil rule a ruler that enables an observer to roughly estimate angular distances.



mil scale

Mil scale the scale consisting of either a horizontal or vertical line, or both, which is divided into mils and

used in range finding devices, such as a submarine's periscope or a military binocular. Sometimes found in modified form in rifle scopes.

Minie ball a conical lead bullet having an inverted iron cap in its base adopted to expand the load upon firing, to take the rifling, and acquire the desired spin. Designed by Captain C.E. Minie of the French Army. Later the British, in 1852, used a hollow base, then still later, a base with a heavy plug fitted into it. It was extensively used in the muzzleloaders of the Civil War by both North and South.

Minie, Charles Claude Etienne, MIN ee (1804–1879) a Captain in the French Army, famous for his development of the conical lead ball with an iron cup in its base, known as the Minie ball.

Minie rifled musket a four grooved rifle firing a conical ball, introduced in 1851, became a British service rifle caliber .702, sighted up to 1,000 yards. Some used in Kaffir and Crimean Wars. Replaced in 1853 by the first famous Enfield, a three groove rifle of .577 caliber.

Mint condition a term used to describe a firearm that is new or in a condition like new.

Minute gun in the military service, a gun fired at regular intervals as a signal or mark of respect to an individual.

Minute, minute of angle one sixtieth of a degree. A circle has 360 degrees, totaling 21,600 minutes. At 100 yards, approximately 1 inch of change of point of impact will be caused by a 1 minute change of the rear sight, since 1 minute subtends 1.047 inches at 100 yards. One minute at 200 yards, about 2 inches, at 300 yards about 3 inches, etc. The same relationship exists with the fractions of a minute. For example at ¼ minute adjustment of a sight will move the strike of the bullet ¼ of an inch at 100 yards; a ½ minute adjustment, ½ of an inch at 100 yards. This unit of angular measure is to civilian rifle use as the mil is to military use.

Miquelet (MICK u let) a form of flintlock distinguished from the snaphaunce by having a heavy mainspring on the outside of the lock plate. The hammer and pan cover is in one piece; thus, when the flint hits the frizzen, the pan is uncovered. Named after the inventors, Spanish or Portuguese marauders, known as "milquelites" or "miguelitos" who developed the lock about the year 1600.

Mirage an optical phenomenon. In shooting, it is the displacement of the target image due to heat waves and the refraction of light as the light rays are bent in passing thru air layers of different density. The intensity of a mirage varies with a shooter's vision.

Misfeed improper feed of ammunition, especially to a magazine fed or belt-fed automatic gun.

Misfire failure to fire or explode properly and completely. By contrast, a hangfire or squib load is delay in the completion of fire or explosion.

Miss failure to hit the target.

Missile an object or explosive device designed to be thrown, shot or propelled by rocket means. Grenades, bullets and ICBM's are missiles.

Mitrailleuse (mee TRI yohz) a generic term used by the French for a machine gun, although originally it only applied to a multi-barrelled weapon, the first having been invented in 1851, being 37 rifled barrels assembled in a tube.

Mm (m/m) abbreviation for millimeter. See "metric system."

M.O.A. abbreviation for minute of angle.

Mock-up a scale model of a weapon used to demonstrate the operation of the actual weapon.

Model 1841 rifle a muzzleloading caliber .54 percussion rifle notable because it was the first percussion rifle made at a U.S. Armory (Harper's Ferry) and the last official U.S. rifle to fire a round ball. Production started in 1846 and ended in 1855, when superseded by the Model 1855 series designed for the caliber .58 Minie ball. The Model 1841 was popularly referred to as the Mississippi rifle or the Jager rifle.

Model designation of sporting arms, may be by name, letter, or number, or a combination of them and varies with each manufacturer. Occasionally, the year the model was introduced will be used. With military arms, the practice varies with each country. The United States Army, since 1925, has followed a standard nomenclature system for all of its ordnance items as described under "M."

Model designation, U.S. Army prior to World War I, United States military arms did not have a standard system of nomenclature or model identification. Basically the word "Model" was followed by the year the model was adopted. Following World War I, the word "Mark", or its abbreviation "Mk" followed by a Roman numeral, was used. In 1922, the letter "M" was followed by an Arabic numeral. This system applies to cartridges as well as other ordnance items.

Model number when part of the description of a sporting arm, it is a number the manufacturer has adopted and ascribed a meaning: when part of the description of U.S. Army ordnance item, it has a specified meaning as described under "M."

Modern pentathlon the modern pentathlon is an Olympic event consisting of five contests: horseback riding, fencing, shooting, swimming, and cross-country running. Three-man teams from participating countries are permitted to compete for individual as well as team awards. Each team is generally made up with a fourth member alternate, though only three

men may actually take part in the competition. The contest spans five days with one event scheduled for each day, usually in the order shown above. The shooting event uses an ISU turning silhouette target having a backing target located one meter behind the original. Distance is 25 meters and the .22 caliber handgun is limited in size to 300mm × 150mm × 50mm. There is a 5 percent tolerance allowed in any one of these dimensions. The handgun may not weigh more than 1.26kg. After an optional practice string of five shots, contestants are expected to fire four series of five-shot strings for a total of 20 rounds and a possible score of 200. A score of 194 earns 1,000 competition points for the individual competitor. Twenty-two competition points are gained or lost for each target point over, or under, 194. Modern pentathlon teams usually consist of men from the military services. Team scores are determined by the aggregate scores of the individual members. (Another Olympic pentathlon event is for women and consists of contests in running, jumping, and shot put.)

Mohs hardness a measure of hardness compared to the hardness of the following substances that are rated from 1 (soft) to 10 (hard): 1. talc 2. sypsum 3. calc spar 4. fluorspar 5. apatite 6. feldspar 7. quartz 8. topaz 9. sapphire 10. diamond.

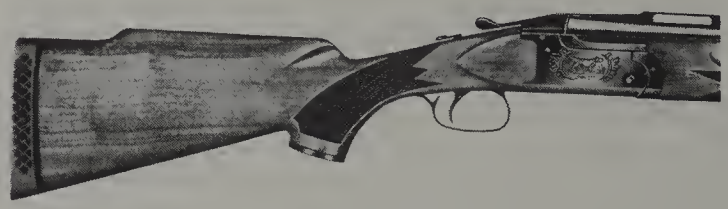
Mold, mould a form adapted to give shape to material applied to it in a plastic or molten condition as, for example, bullet molds into which molten lead may be poured so that upon cooling, bullets of the form of the mold will be produced.

Molybdenum (moh LIB deh num) a metallic element, whose chemical symbol is Mo, frequently used in making high grade steel alloys for special purposes. Molybdenum is known for its malleability and for its high heat resistance. It has a melting point of 4730°F.

Momentum is the quantity of motion. The linear momentum of a body is the product of its mass and its linear velocity.

monocular

Monocular an optical instrument designed for use with one eye, as opposed to binocular, which is designed for both eyes. A rifle scope is monocular.



monte carlo

Monte Carlo a particular type of gunstock design characterized by a pronounced drop in the comb line as it meets the heel of the butt. A Monte Carlo design is often required in order to position the butt properly at the shoulder when the line of sight has made employment of a high comb necessary. To be a true Monte Carlo, the comb line must parallel the line of sight from the start of the comb to the point of the Monte Carlo drop.

Moorish engraving a form of art used in firearms decoration which originated with the Moors of North Africa. Moorish style engraving consists entirely of floral and scroll patterns. Because the Moors once invaded and occupied Spain, Spanish engraving and carving often reflects the Moorish influence.

Morning gun in the military service, a gun fired at the first note of reveille or at sunrise. Also called "reveille gun."

Morrone an over and under shotgun manufactured by the Rhode Island Arms Company of Hope Valley, Rhode Island between 1949 and 1953.

Morse the name of a metallic cartridge patented in 1858. It had a percussion cap which exploded when crushed against a heavy wire anvil attached to the inside of its case.

Mortar a short barreled, short range, high angle fire weapon classified as artillery although employed by infantry troops. Usually smooth bored.

Mortar ignition cartridge a shotgun type shell designed for military use with the firing of mortars, containing a fast burning powder.

Mortise a cavity, hole or opening into which, or through which, another part fits or passes. Combined with a tenon, it may form a mortise and tenon joint.

Morton Grove (Illinois) the only town in America that has seen fit to arbitrarily ban the possession of

handguns; an attitude considered by some to be tantamount to declaring, "We can't trust anyone in town!" (At this writing, the Morton Grove case is scheduled to be contested before the Illinois Supreme Court.)

Mosin-Nagant a 7.65mm 5 shot bolt action, magazine fed standard military rifle of Russia from 1891 to about 1946. Designed by Colonel S.I. Mosin and Belgian arms designer E. Nagant, it was the first smokeless powder rifle adopted by Russia (1891).

Mossberg a trademark of the firearms manufacturing firm of O.F. Mossbert & Sons, 7 Grasso Ave., North Haven, Connecticut.

Mottling a method for obtaining spots, blotches and stain-like appearances on a metal surface in different colors or shades of color. On steel, such colors are obtained by heating to a cherry red heat for several minutes in a cyanide of potassium bath and then, while dipping in water, moving the piece about vigorously. Used in the decorative treatment of metal surfaces of guns.

Mount 1. a supporting structure or base for a gun. 2. a device used to affix a telescopic sight to a firearm.

Mount adapter a device to make a gun fit properly into a mount.

Mouth an opening into a cavity or tube; the open end of a cartridge case is called the mouth of the case.

Moving target a target that moves. In international running deer competition, it is a facsimile of a deer mounted on a moving carriage and exposed to the shooter (at a range of 100 meters) for four seconds as it traverses a 25 yard corrider between protective butts. The deer target travels at about 13 mph. Flying clay targets, used in skeet and trap shooting, may also be referred to as moving targets — their flight speed is approximately 50 mph as they leave the traps.

Mps, m/p.s. the abbreviation for "meters per second", used in the metric system of measurement to express the velocity of a projectile.

Muff pistol a type of small, single shot pistol, generally not over 3 inches in overall length, of small caliber, made around 1875.

Mule ear a colloquial expression for a hammer that pivots at an oblique angle, or sidewise, rather than vertically.

Mullering tool a wood-carving tool with saw-like teeth used for cutting borders in checkering patterns.

Multi-firing a firearm capable of being fired more than once without reloading, may be so called.

Multiple gun a group of guns emplaced, mounted or adjusted together for firing as a unit.

Multiple leaf sight a type of open rear sight having two or more folding leafs. Each leaf is pre-set for a specific range and this enables the shooter to adjust for the desired range by simply raising the appropriate leaf.

Multipurpose gun a gun suitable for a number of different types of target or game.

Munitions a word that embraces ammunitions, weapons and all other kinds of necessary war materials.

Muriatic acid another name for hydrochloric acid.

Mushroom the effect produced by certain bullets by expanding on or shortly after impact. The word is also used for some soft point or hollow point bullets. See "SP" and "HP."

Musket a smooth bore shoulder firearm used by soldiers. Until about 1750, all military shoulder arms of smooth bore were called muskets. The term later was applied indiscriminately to rifled as well as smooth bores. The name originated early in the 16th century for a form of arquebus as a "maschetto" in Spanish, "mousget" in French and in England it became in sequence "mousquit," "mouskitt" and eventually "musket."

Musket cap a large form of percussion cap generally equipped with a flared base and resembling a miniature top hat. See "percussion cap."

Musketeer a soldier armed with a musket.

Musket-fusil an early 17th century arm known as a fusil-mousquet in France. It had two locks, a matchlock and flintlock. Lack of confidence in the reliability of the new type of lock gave rise to the retention of a matchlock as insurance.

Musketoon a colloquial term for a muzzleloading firearm of carbine length having a large smooth bore.

Musketry fire delivered by rifles or other small arms. Also means training in the use of such.

Mutual Security Act of 1954 (22 U.S.C. 1934) authorizes the President of the United States to control the export and import of arms, ammunition, and implements of war, including technical data relating thereto. This authority was delegated to the Secretary of State who administers control through his Office of Munitions Control. By Executive order, coincident with the effective date of the Gun Control Act of 1968, the control of importation of articles on the U.S. Munitions List was transferred to the Secretary of the Treasury.

Muzzle the front of a gun barrel from which the bullet emerges.

Muzzle blast the surge of hot air and gases that bursts from the muzzle of a gun as the projectile leaves it. Also called powder blast.

Muzzle bore sight generally a disk with cross hairs that are exactly in the center of the bore when the disk is fitted into the muzzle end of a gun. Used with

a "breech bore sight" to establish the axis of the bore.

Muzzle brake an attachment secured to the muzzle of a gun, which may be a cannon, rifle or shotgun, to utilize some of the muzzle blast to apply a foreward force to the barrel at the instant the gun is reacting backward in recoil. Basically, it is a tube screwed to the muzzle, having a bore slightly larger than that of the barrel to enable the bullet or shot charge to pass freely through it. The wall of the tube is provided with holes or slits at right angles to the bore or inclined backward and outward at a slight angle to permit a portion of the muzzle blast to thus act against the tube and escape from it.

muzzle cap

Muzzle cap a cap for covering the muzzle end of a gun barrel to keep out deleterious matter.

Muzzle compensator a device attached to the muzzle of a gun barrel which utilizes the escaping gases to control the direction and amount of undesireable muzzle movement. It may also reduce the recoil energy of the weapon.

Muzzle energy the energy of a bullet at the instant it leaves the muzzle of a gun, expressed in foot pounds.

Muzzle flash the flash that appears at the muzzle of a gun when it is fired. It is caused by the expanding powder gases that ignite when they and burning powder pieces meet the air at the muzzle of the gun.

Muzzle guard a cap, usually made of brass, to fit over the muzzle of a gun barrel, having a hole in its center concentric with the bore of the barrel. The diameter of the hole is just large enough to admit a cleaning rod. Purpose of the muzzle guard is to prevent wear at the muzzle end of the bore for those rifles cleaned from the muzzle. It is usually employed with .22 caliber match rifles. See "cleaning bolt."

Muzzle jump refers to the muzzle motion of a gun upon firing. While many factors combine to put a fired gun into motion, "muzzle jump" is essentially caused by the fact that the axis of the bore rests above the mass of the gun. Also, when holding a rifle or shotgun in a shooting attitude, the marksman grips the forend (below the barrel) with one hand while positioning the other hand around the grip and trigger guard, which likewise lies below the axis of the bore. As the weapon recoils, the muzzle will naturally take the path of least resistance and move in an upward direction. Initially, however, as described under "barrel whip," the muzzle end of the barrel may dip downward, flexing, before stabilizing in a straight bore position.

Muzzleloader a gun loaded with propellent powder and projectile only through the muzzle end of the bore.

Muzzleloading the act of loading a gun through its muzzle end, as in the case of a muzzleloader.

Muzzle protector See "muzzle guard."

Muzzle sight another name for "front sight."

Muzzle velocity the velocity of a projectile at the instant it leaves the muzzle of a gun. Also known as the "initial velocity." Abbreviated as MV.

Muzzle wave the compressed air that fans out from gun's muzzle after firing, also called "gun wave."

MV abbreviation for "muzzle velocity."

N

Nagant a seven chambered 7.62mm Russian revolver adopted by Russia and Poland about 1895.

Naked bullet a bullet not encased in a metal jacket or covered by a patch.

Nambu an 8mm, 8 shot semi-automatic pistol used by the Japanese Army from 1914 to 1945, although not officially adopted as a standard.

National Bench Rest Shooter's Association a national organization of those interested in precision shooting, founded 1951 and having headquarters in Minerva, Ohio.

National Board for the Promotion of Rifle Practice was authorized by Act of Congress in 1903, and consists of from 21 to 25 members appointed by the Secretary of the Army from the Army, Navy, Air Force, Coast Guard, Reserve Officers Association, National Guard Bureau, Selective Service, National Rifle Association and the country at large. The principal mission of this Board is to promote, among United States citizens, practice in the use of military-type small arms, provide arms, ammunition and accessories, and arrange for matches and competitions in their use. Responsibility for conducting the National Matches has been delegated to it by the Secretary of the Army.

National Firearms Act was signed into law June 26, 1934, and is designed to control so-called gangster weapons such as machine guns, silencers, rifles with barrel lengths of less than 16 inches, shotguns with barrel lengths of less than 18 inches, etc., by imposing a high tax on their importation, manufacture and transfer, and requiring their registration. The "National Firearms Act Amendments of 1968" was enacted into law on October 22, 1968, along with the "Gun Control Act of 1968," as part of a comprehensive program to make firearms laws more stringent. The Secretary of the Treasury administers the law and promulgates regulations to implement it.

National Match Ammunition National Match ammunition in caliber .30 and caliber .45, was manufactured on an annual basis for the "Camp Perry" matches during the period of 1919 through 1940, discontinued until 1957, when it was reintroduced under the following designations: Cartridge, Match, Caliber .30 M72 (National Match) Cartridge, Ball, Match Grade, Caliber .45 M1911 (National Match). All quantities of the match cartridges, through 1940, and the initial 1957–58 quantities, were manufactured at Frankford Arsenal. Since then, all annual requirements of the caliber .30 and caliber .45 Match cartridges were and are produced at other ammunition facilities having greater daily production capacities. The 7.62mm Match M118 cartridge was approved for production at Frankford Arsenal in August of 1964. Subsequent annual requirements are being produced by Lake City Army Ammunition Plant. Upon reactivation of the "Camp Perry" National Matches in 1953, available stocks of service type caliber .30 Ball M2 and caliber .45, Ball M1911 ammunition were screened, retested and the best qualified lots of each type were selected annually for each year's matches until stocks of the National Match cartridges were made available. Cartridges designated as "NM" and "Match" are produced to the same specification requirements; however, additional care is exercised in manufacture of the lots specifically intended for Camp Perry, which are head stamped "NM" in lieu of "Match." Each year's production of NM ammunition is shipped to Erie Ordnance Depot for storage until required by the National Match Ordnance Officer. This ammunition is then issued on the "ready line" of the pertinent Camp Perry rifle and pistol matches. Stocks of the Match cartridges are distributed to the Military Services for training purposes and used in their area and sectional matches.

National Matches established in 1903 by Act of Congress, with participation limited initially to teams from the regular services and state National Guard organizations. In 1916, upon passage of the National Defense Act, civilian teams were permitted to join in the competition. Now held annually at Camp Perry, Ohio, the National Matches are comprised of three programs: 1. The Small Arms Firing School 2. The National Trophy Matches 3. The National Rifle Association Championships. The National Matches are conducted under the general supervision of the National Board for the Promotion of Rifle Practice.

National Muzzleloading Rifle Association a National organization of those interested in black powder shooting, founded in 1937 and most recently having headquarters in Friendship, Indiana.

National Rifle Association, The a non-profit organization founded in 1871, with headquarters in Washington, D.C., and whose purpose it is to promote the safe, efficient, lawful and rewarding knowledge

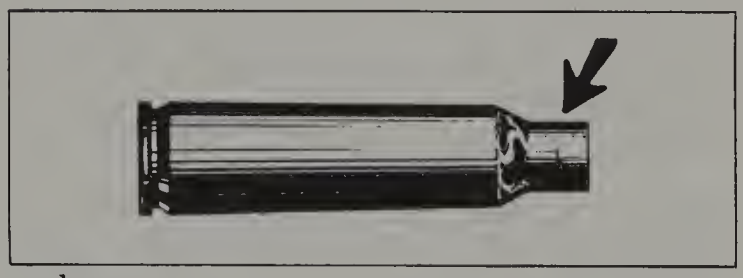
and use of firearms. It is the largest and best known firearms association in the United States, and numbers approximately three million members.

National Shooting Sports Foundation commonly referred to as the "NSSF," this organization is headquartered at 1075 Post Road, Riverside, Connecticut, and was founded as a non-profit organization in 1961 for the purpose of promoting a better understanding of the shooting sports by the American public. Membership is limited to firms that offer a product or service to hunters or shooters. Associate memberships are open to firearms distributors and dealers.

National Skeet Shooting Association a national organization having its headquarters at 3409 Oak Lawn Avenue, Dallas 19, Texas, the authority in the United States for rules and procedures governing skeet competition and the classification of competitors.

Near miss a projectile or bomb that does not score a direct hit on the target but is close enough to inflict some damage.

Neat's foot oil an animal oil, pale yellow in color and with a peculiar odor, obtained by rendering the hooves of cattle. Used for softening leather slings and for dressing leather belts and holsters, and as a lubricant.



neck

Neck the portion of a bottleneck cartridge case that is of reduced diameter and into which the bullet is seated.

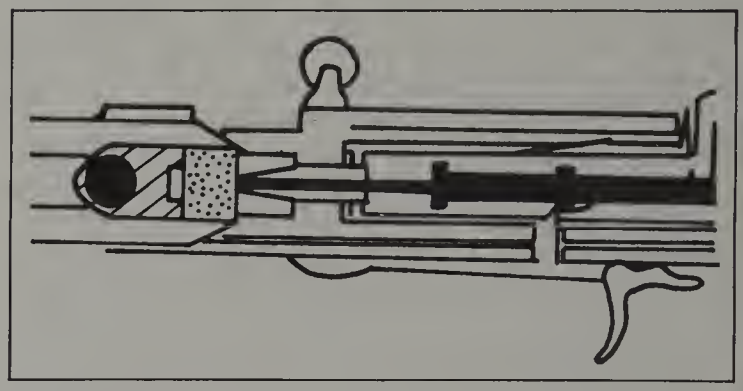
Neck crack a crack in the neck of a metallic cartridge case generally caused by repeated stretching and squeezing of the case in resizing.

Neck sizing the practice of re-shaping, or of restoring to original dimensions, only the neck of a cartridge case when reloading it for re-use in the same weapon that fired it originally. Neck sizing, as opposed to full length sizing, prolongs case life.

Needham the name of a needle gun developed in England after the Franco-Prussian War. It was a repeating rifle having a tube below the barrel for a magazine, and a revolving cylinder.

Needle file a very fine, slender, machinist's file for delicate work in confined areas. Needle files come in a large variety of shapes.

Needle fire the means by which the propellent charge in the paper cartridge case used with the Prussian needle gun was ignited. The needle-like extension of what would be a firing pin in a modern gun had to penetrate through the case and its charge before striking the primer, which also was contained within the case.



needle gun

Needle gun a percussion gun adapted for use with a cartridge having a primer located within it. The gun has a needle that can pierce the cartridge and strike the primer, thus setting off the charge. Both muzzle loading and breech loading guns employed this form of ignition system. The Dreyse was the best known needle gun.

Negative lens a lens that causes light rays to diverge, i.e, extend from a common point in different directions.

Neoprene an oil resistant synthetic rubber.

NH powder See "nonhygroscopic powder."

Nickel is a hard, white, malleable, ductile, rust resistant element whose chemical symbol is Ni. It is extensively used for plating less durable metals, and the fiction writer's reference to "nickel plated revolvers"

nickel finish

has basis in fact. Alloyed with steel to form nickel steel, it is used for armor plate and other similar products.

Nickel finish a nickel plating applied to a firearm, usually a handgun, applied by electro-chemical means to result in a rust-resistant finish.

Nickel steel a steel with 3½ percent of nickel and 0.32 to 0.40 percent carbon, used in the making of high power rifle barrels.

Nipple the cone-shaped part of a percussion gun, which is adapted to receive a percussion cap over its centrally located hole, which communicates the flame from a cap to the powder charge in the barrel.

Nipple pick a short pointed metal pick either separate or in conjunction with a nipple wrench, used to clean out clogged nipples of percussion type firearms. Sometimes called a "frizzen pick."

nipple wrench

Nipple wrench a wrench carried as an accessory, used to unscrew broken or corroded nipples of percussion type firearms and for screwing on replacements.

Niter a common name, just as is saltpeter and nitrate of potash, for potassium nitrate.

Niter bluing process a method of imparting a blue color to iron or steel by immersing a few seconds in molten potassium nitrate (also called nitrate of potash, niter or saltpeter) maintained in an iron pot at about 600 degrees F. Lower heats give lighter shades, higher temperatures darker colors.

Nitric acid whose chemical symbol is HNO_3, is a colorless solution, used in gunsmithing for etching steel gun parts.

Nitro sometimes used as part of the identification of a cartridge to indicate its propellent as distinguished from black powder.

Nitrocellulose the composition resulting from the treatment of cotton or other form of cellulose with a mixture of nitric and sulfuric acids. It is the base for all modern smokeless powder. Guncotton is a nitrocellulose having a very high nitrogen content.

Nitrocellulose powder high powered smokeless propellent powder. Pyropowder is a type of nitrocellulose powder.

Nitrocotton See "guncotton."

Nitrogen filled refers to rifle scopes that are filled with nitrogen gas during the final stages of manufacture in order to prevent fogging when exposed to temperature changes in the field.

Nitroglycerin, nitroglycerine a highly heavy, thick, syrupy liquid made by treating glycerin with a mixture of nitric and sulphuric acids. It is very sensitive to shock and friction.

Nitro wad See "wad column."

Nobaloy an alloy of from 90% to 95% copper and 10% to 5% of zinc with a small percentage of tin, so-called by its English manufacturer to distinguish it by name from Lubaloy.

Nobel, Alfred Bernhard (1833–1896) a prolific Swedish inventor who produced dynamite in 1863, and later other explosives, including a form of smokeless powder that was later developed into cordite. By his will, he established the famous Noble Prizes awarded for services to mankind.

No-bird an illegal or broken target in skeet or trap shooting. The shooter is not required to shoot at such a target, however, if he does, it is ruled a legal bird and he must clearly hit one of the larger segments to avoid having it scored as a miss. When he does not shoot at such a target, he may simply call for another bird.

Nock, Henry (1741–1804) an English gunsmith, active 1772 to 1802, who invented an enclosed lock, which substituted pins and hooks for the usual screws. His 1787 breech patent enabled use of a shorter barrel because it fired the propellent charge through the breech.

Noise the disagreeable effect of certain sounds upon the ears. The disagreeable effect varies with the hearer and is not susceptible to measure on a universally accepted standard. Intensity of noise and sound is measurable. See "decibel."

Nomenclature the system of names or titles officially assigned to weapons and other material and equipment. The Standard Nomenclature Lists (abbreviated SNL) of the U.S. Army prescribe the official designation given to ordnance material. See "M."

Non-corroding, non-corrosive as applied to ammunition, it is ammunition using a primer that does not deposit rust producing salts on the surface of the bore of a gun.

Nonexplosive a material or object that will not explode under any circumstances.

Non-ferrous metals metal alloys that do not contain iron. Steel is a ferrous alloy; brass is a non-ferrous metal.

Nonhygroscopic powder a smokeless powder having no tendency to absorb moisture from the air; used as a propelling charge. Termed in brief, NH powder.

Non-registered a shoot, match or tournament that is not registered with the parent organization.

Nordenfelt one of the best known mechanically operated machine guns of European manufacture. Inventor of the system was Heldge Palmcrantz, a Swedish Engineer; its promoter was Thorsten Nordenfelt (1842–1920), a Swedish banker in London. The earliest design was made in 1872.

Norma refers to those munitions manufactured by the firm Norma Projektilfabrik of Amotfors, Sweden. The name "Norma" is also used by their American representatives: Norma-Precision Company of South Lansing, New York.

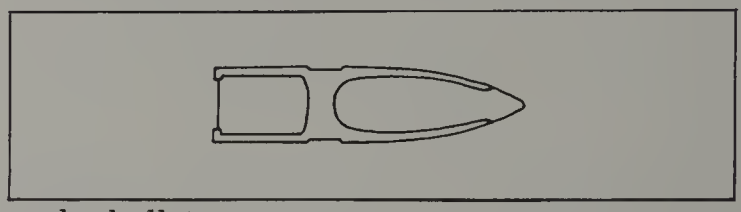
Normal charge the regularly prescribed quantity of powder used with a gun. Under special circumstances, a reduced or a supercharge may be used.

Normal impact the situation when a projectile squarely strikes a surface, that is, the line of flight of the projectile is normal (perpendicular) to the surface.

North, Simeon (1765–1852) an American gunsmith and well known manufacturer of pistols and rifles for the United States Government.

North-South Skirmish Association a national organization of those interested in paying tribute to the soldiers of both sides in the War between the States and to show use of their weapons. Headquarters at Pennsauken, New Jersey. Affiliated with the National Rifle Association of Amercia. This organization has many regional chapters spread across the country. Uniforms and accessory paraphenalia are as important to members as the firearms themselves.

Nose the point or foremost part of a projectile.



nosler bullet

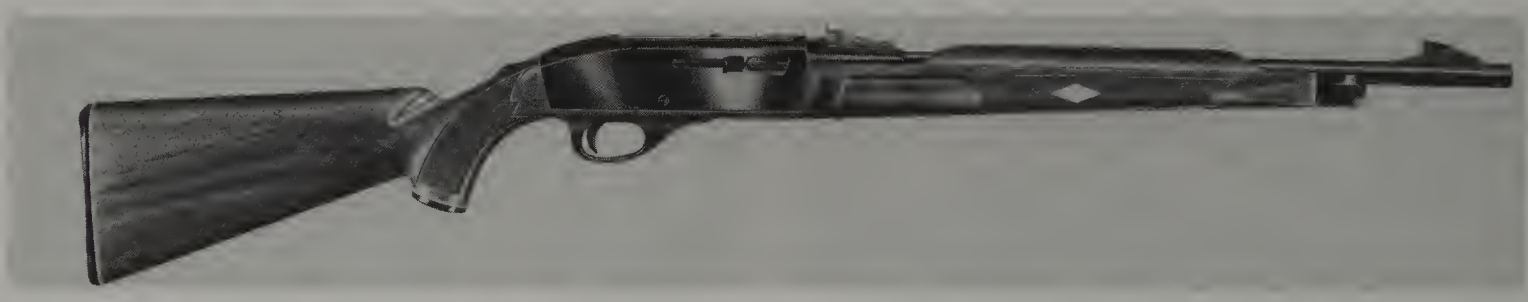
Nosler bullet an American made partition bullet manufactured by the Nosler Partition Bullet Company of Bend, Oregon. Nosler bullets are available in some commercially loaded cartridges and are sold separately to those who are interested in handloading them.

Notch sight is a sight of the post type having a square, U, or V shaped notch in its top edge.

NRA abbreviation for The National Rifle Association.

Nutcracker tool a colloquial name for Lyman Gun Sight Company's famous #310 Tong tool. This is a reloading tool consisting of two handles hinged together at one end (not unlike a nutcracker) and into which are fitted the required reloading dies. Entirely hand operated, this tool will perform all normal reloading operations except full-length sizing and powder measuring.

Nylon the generic term for a series of polyamide resins having many uses. It has been used for gun stocks and for barrels. Its use for barrels is as a sheath for a steel inner tube.



nylon (nylon stock)

O

Oberndorf the town in Wuerttemberg, Southern Germany, where the brothers Peter and Wilhelm Mauser founded the Mauser Works — an arms manufacturing facility that achieved world-wide fame.

Objective end that portion of an optical instrument which houses the objective lens — the lens that picks up the light rays transmitting the image. The objective end is that portion of the instrument that is farthest from the eye when in use.

Objective lens the first, or light-gathering lens in an optical instrument.

Obsolete describes something no longer in use. As applied to firearms, generally taken to mean those guns no longer being manufactured, having been replaced by newer models. An obsolete firearm is not necessarily an antique. See "antique."

Obstruction See "barrel obstruction."

Obturate, obturation (OBB too rate, OBB too RAY shun) to seal off the breech end of a gun to prevent the escape of gases, usually by the expansion of the cartridge case against the wall of the breech chamber. Obturation is the name given the process by which the escape of such gases is prevented. Obturator is the name given the device by which the breech end of a gun is made gas tight.

O'clock according to the clock. In shooting, the standard clock having numbers 1 to 12 on its face is used to designate direction from the shooter or from the center of a target.

Octagon barrel a gun barrel having an eight-sided exterior surface.

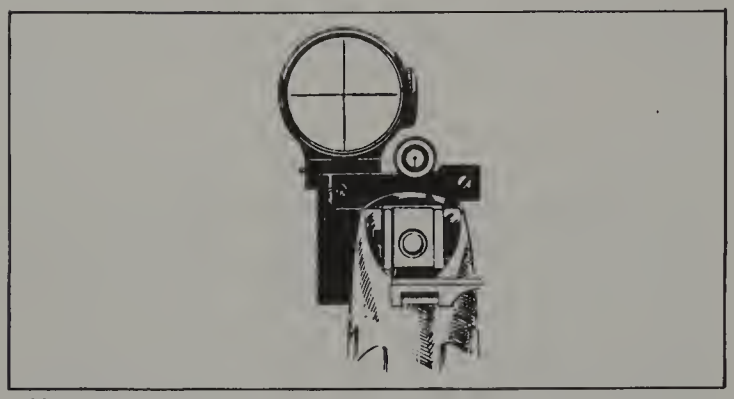
Ocular 1. the eyepiece of an optical instrument. 2. pertaining to the eye.

Odkolek, Baron Adolph von an Austrian Army Captain who, in 1893, associated himself with the Hotchkiss gun manufacturing organization and there introduced a new application of gas power to an automatic arm — the gas piston housed in a cylinder beneath the barrel.

Offhand shooting from an erect standing position with the firearm supported only by the arms and hands. While this is often called the "standing" position, "offhand" is the term that is technically proper.

Offhand position, handgun as prescribed in U.S. Army and Air Force training, the shooter stands half facing the target, feet spread 12 to 18" apart with weight of body balanced equally on both feet, legs straight without stiffness, hips level and with stance adjusted so firing arm points naturally at target. With a proper one hand grip of pistol or revolver pointed at target, with muscles of arm firm but not rigid, wrist locked, elbow straight and locked with recoil to be taken on shoulder point as pivot. Also called standing position (which see).

octagon barrel



offset mount

Offset mount a telescope mount fastened to a rifle in such a way that the axis of the scope is offset to one side of the rifle bore rather than directly above it. While this is not the most desirable mounting arrangement, it is one of the two possible methods where top ejection guns are concerned. Shooters with eye problems are often forced to use offset mounts so that they may continue to shoot from the right or left shoulder while sighting with the opposite eye.

Offset trigger a trigger that is not positioned under the center line of the firearm or one that travels in an oblique rearward direction when pulled.

Ogive (O JIVE) 1. the curved forward part of a projectile up to, and including, its pointed end. 2. the radius of the curve of the nose of a bullet commonly expressed in calibers.

Oil a liquid substance that is combustible, or meltable upon warming, and soluble in ether but not in water. The term covers a large number of substances having mineral, animal or other organic origin. A thin oil is desirable for firearms generally. Rapid fire guns, such as machine guns, require heavier oils because of the high heat developed in continuous firing.

Oil dent a defect in a cartridge case consisting of a smooth depression caused by the use of too much oil in its manufacture, too much oil in the chamber upon firing, or too much oil in the die upon re-sizing.

Oiled case pressure gage a device used by the British for measuring the breech pressure developed by a cartridge. A special bolt or breech block is used, in which a hollow copper cylinder is placed between an anvil and a piston. A cartridge case, well oiled to prevent sticking to the walls of the chamber, is inserted in the chamber, its head resting against the piston. Upon firing, the case slides backward and compresses the cylinder. The amount the cylinder is shortened will, when compared to a reference table, called a tarage table, disclose the pressure in the breech that compressed it.

Oil finish a gunstock finish created by hand-rubbing with linseed or tung oil. Contrary to popular belief, a good stock finish cannot be achieved by oil alone: the stock must first be treated with a filler and a sealer. After the sealer has dried, the stock is finely sanded and finished with light applications of oil. Modern stock finishes, such as those made with epoxy resins have proven superior to oils and are gradually replacing oil finishes.

Oilstone a whetstone treated with oil and used for polishing or sharpening steel components.

Omnibus Crime Control and Safe Streets Act of 1968 was enacted into law on June 19, 1968, and among other provisions, repealed the Federal Firearms Act as of December 15, 1968, and replaced it with Chapter 14 of Title 18 of the United States Code that later was rewritten by the "Gun Control Act of 1968." The Omnibus Act also declared the receipt, possession or transport of firearms in commerce by felons, mental incompetents, and certain others as unlawful.

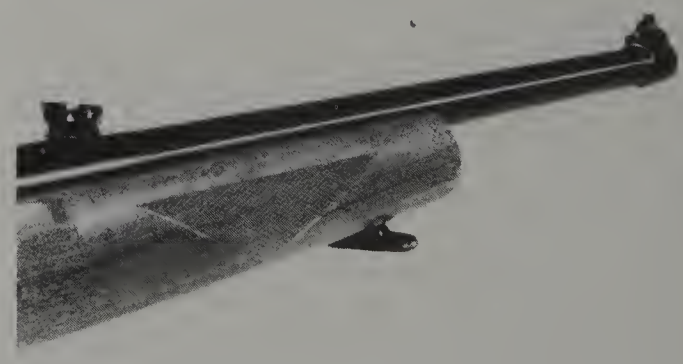
One-piece mount See "bridge mount."

OPE an abbreviation for open point expanding bullets, constructed with a hollow point.

Open-breech action a system wherein the breechblock is held to the rear by a compressed spring, which, when released by pressing the trigger, permits the breechblock to move forward during which time a cartridge is carried into the chamber. When the breechblock closes, a firing pin strikes the primer of the cartridge. The Browning automatic rifle contains such an action. See "closed-breech action."

Open match a target competition that is open to anyone, although participation may be limited to citizens of the U.S. and members of The National Rifle Association.

Open point a bullet having a cavity in its nose to increase the expansion of the bullet when it hits, also called "hollow point."



open sights

Open sight the traditional form of metallic sight

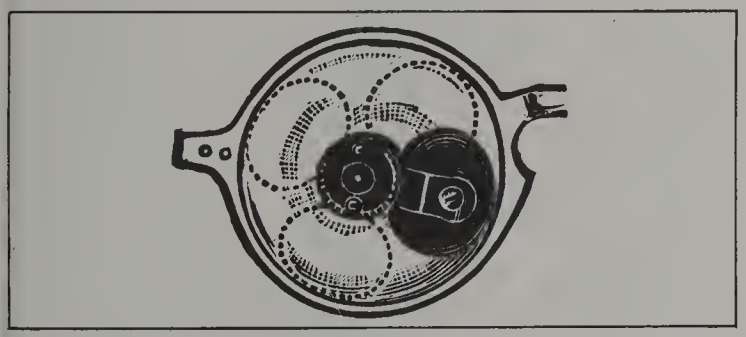
made with two components: a notched rear sight and a post or blade front sight.

Operating handle the handle or grip by which a shooter may move the operating lever, to open and close the breech of a gun.

operating lever

Operating lever a lever device to open and close the breech of a gun.

Operating slide the mechanism in a Browning Automatic Rifle that permits the opening of the breech for loading, unloading, clearing out stoppages, and closing the breech for firing.



optical attachment

Optical attachment an eyepiece sighting disc (for a receiver sight) made to hold a prescription lens. Intended for shooters who ordinarily must wear glasses.

Optical sight a sight that employs an optical system of lenses, prisms or mirrors, to aim a gun.

Optics the science of light and vision.

Ordnance (ORD nance) military material of many kinds but principally combat weapons, ammunition, bombs, rockets, mines, explosives, pyrotechnics, combat vehicles, and accessories. Abbreviated as ORD.

Ordnance steel a steel containing from 0.45 to 0.55 percent of carbon, 1.00 to 1.30 percent manganese, and up to 0.05 percent of phosphorus and 0.05 percent of sulphur used until about 1941 for rifle and shotgun barrels, having been introduced at the start of the 20th century.

Oregon myrtle wood from the myrtle tree of the Pacific Northwest, which is used more and more frequently in gunstock work. Varies greatly in color (from orange to dark brown) and in grain figuration; resembles walnut in weight and working characteristics but has frustrating warping tendencies.

Organ battery a number of gun barrels mounted on a frame or carriage, in the 16th and 17th centuries, adapted to be fired at one time.

Orifice an aperture, opening, port or vent. The gas vent in the receiver of a rifle is an example.

Origin of the trajectory the center of the muzzle of a gun at the instant the projectile leaves it.

Ornamentation as applicable to firearms: any form of decoration such as contrasting woods, checkering, carving, engraving, or inlays made from precious metals.

O/U abbreviation for over and under, referring to the arrangement of the barrels on a shotgun or combination rifle-shotgun. This term is used almost exclusively for long guns in spite of the fact that there have been handguns made with two barrels mounted in a vertical fashion.

Outlaw a slang term for an illegal target in skeet or trap shooting.

Outrange the ability of one firearm to deliver a projectile at a greater distance than some other firearm.

Outshoot to shoot more accurately or more effectively than someone else or some other weapon.

Outside lubricated bullet a bullet having a diameter for the cylindrical or bearing portion just outside the mouth of the case about equal to the outside diameter of the mouth of the case. The bullet has a smaller diameter or heel at that portion lying within

over & under gun

the mouth. Grooves or cannelures in the exposed cylindrical portion contain a film of lubricating grease or wax. See "inside lubricated bullet."

Oval-bore rifling an oval shaped bore, the oval being twisted to give the bullet a spinning motion, made in London about 1850. This construction was developed to take the place of lands and grooves.

Over a shot that strikes or bursts over or beyond the target. One that fails to reach the target is called a "short."

Over & under gun a type of firearm having two barrels mounted one above the other.

Over bore capacity applied in describing a cartridge case that has a capacity that exceeds the amount of powder that can be most efficiently used in it.

Over powder wad See "wad column."

Overshoot to shoot over or beyond a target.

Over-shot wad See "wad column."

Overtravel the continued movement of a trigger rearward, beyond the point at which the gun is fired.

Owl's head the figure of an owl's head was registered as the trademark of Iver-Johnson's Arms & Cycle Works for firearms. It was used on the grips of revolvers made by it and caused gun collectors to refer to such a revolver as an Owl's head.

Oxidation is the slow combining of oxygen with various elements and compounds. Rust is a form of oxidation. The rust on iron is iron oxide. Rapid oxidation is called combustion. When extremely rapid and noisy it is called an explosion.

Oxyacetylene welding (OX ee ah SET i leen) See "welding."

P

Pacific International Trapshooting Association an organization of those interested in trapshooting in the Western U.S., founded 1928 and having headquarters in Salem, Oregon.

Pacific maple a species of maple tree grown in Washington, Oregon and parts of California. The wood from this tree is dense but soft and, though occasionally used in gunstock-making, is a poor substitute for walnut.

Pack as a slang word, to carry a gun, usually a handgun.

Packard custom made rifles designed by Ralph G. Packard in the 1930's.

Pad, recoil See "recoil pad."

Paine, Ira Anson a famous United States pistol shot of the late 1800's, developer of the bead front sight and U-notch rear handgun sight combination, formerly very popular.

Paine sight a "bead on a post" front sight, with a half round notch rear sight, designed by Ira Paine in the late 1800's.

Palmer, William R. an American gunsmith and inventor, who, in 1863, patented a bolt breech locking design that was a step toward the bolt action later to become popular.

Palm pistol a popular hand held pistol of the 1890's. Designed to fit in the palm of the hand, it was discharged by squeezing the fist, giving rise to the other name by which it was known — a squeezer pistol. Made in both single shot and repeater systems.

Palmrest an auxiliary hand grip for a rifle that may be used in unrestricted (free rifle) competitions when shooting from the offhand (standing) position. A palmrest enables a shooter to rest the elbow of his leading arm against his hip, thereby serving to help him steady the rifle.

Pan the receptacle in a matchlock, wheellock or flintlock for holding the priming powder in suitable position between the igniting means and the propellent charge.

Pan cover a plate over the pan to protect the priming powder from spilling or getting wet.

Panoramic sight a sight usually for cannon, giving the gunner a wide field of view.

Paper patched bullet a smooth lead bullet of bore diameter, tightly wrapped with strong thin paper to increase its diameter to groove diameter. The paper was folded over the bullet base. On firing, the lands cut the paper, giving the bullet a spinning motion without marring its surface. It also served as a gas seal and reduced lead fouling of the bore. The patch left the bullet at the muzzle. Black powder cartridges were sometimes loaded with these bullets, which gave excellent accuracy. Most often used with breechloading black powder guns.

Paper shell a term used in referring to a paper-cased shell for a shotgun.

Parabellum a German term meaning "for war." It was also the name for a German machine gun used in both World Wars and is the name popularly used in Europe for the official German Army sidearm, the Pistole 08 (from 1908 to 1938) that Americans know as the "Luger."

Paraffin test the common name for the diphenylamine test to detect the presence of nitrates on the human hand. It consists of applying hot clean paraffin to the hand to pick up the powder residue left by the firing of a pistol or revolver. By chemical analysis, the presence of nitrates will be detected. This test is not considered to be conclusive proof that a pistol or revolver has been fired, since nitrates may be found on the human hand from causes other than from powder combustion deposits.

Parallax 1. the not readily apparent margin of deviation occuring when a riflescope focussed for one distance is used at another. Fixed focus scopes are generally focussed for a distance of 100 yards: parallax effect becomes more noticeable as distance increases beyond that range (negligible at shorter distances). Scopes for long range shooting are invariably designed with adjustable-focus objective cells. 2. the apparent difference in the location of an object viewed from two different points. Also called azimuth difference.

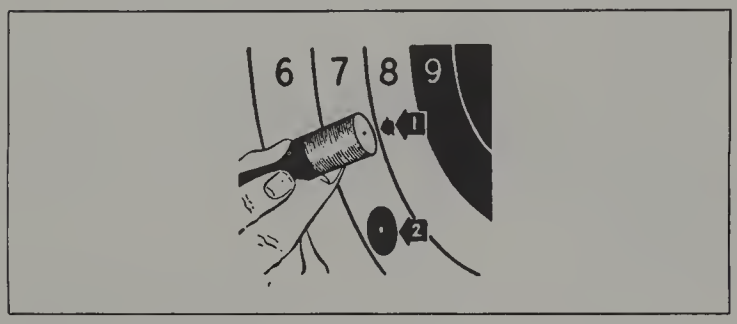
Parker a famous American manufacturer of double barrel shotguns. Located in Meriden, Connecticut, until acquired by the Remington Arms Company in 1934, when all production facilities were moved to Remington's plant at Ilion, New York. The manufacture of Parker guns was discontinued in 1942.

Parkerizing applying a grey colored rust preventative finish to the metal surfaces of a firearm by the use of an appropriate acid solution. See "phosphatizing."

Partition bullet a comparatively modern development in bullet design intended for big game hunting. Controlled expansion and penetration is achieved by separating the lead core of a jacketed bullet into two

parts: the forward portion expands upon impact, while the rearward portion remains intact. See "H-Mantle" and "Nosler."

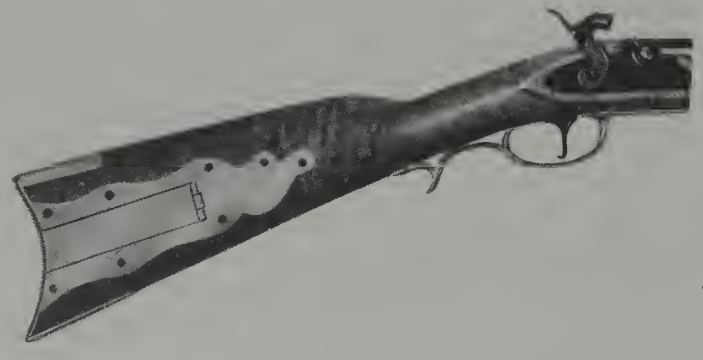
Pass shooting a term used by hunters to describe the type of shooting practiced when birds over-fly a shooting site without landing nearby. Commonly used by waterfowl hunters but may also be used by dove hunters to describe long-range scattergunning at fast-flying targets.



paster

Paster a piece of adhesive white or black paper used to cover previously made bullet holes to permit continued use of the target.

Patch 1. a small piece of soft cloth adapted by size to be used in cleaning the bore of a gun. 2. a piece of cloth such as linen, denim, muslin, canvas or cleaning patch material wrapped around a bullet to serve as a gas seal and to facilitate rifling engagement in black powder arms, especially muzzleloaders. Some patches were also made from paper. 3. when metal jacketed bullets were first employed, a lead or lead alloy bullet coated with metal was called a metal patched bullet, a term still in use today.



patch box

Patch box a trapdoor covered receptacle in the stock of a long gun (usually a muzzleloading rifle or shotgun) designed for storage of bullets or patches, though frequently employed to carry other accessories.

patch lubricant

Patch lubricant a term common to the muzzleloading sports and used to describe anything from saliva to axle grease, which is used to lubricate the cloth patches wrapped around ball projectiles to facilitate loading into the bore.

Patent a monopoly granted by the government to an inventor, which gives him the exclusive right for a fixed term of years to designate who shall be allowed to make, use or sell the embodiment of his invention. This means that even an individual who, for his own use, wishes to make a gun that includes a patented invention is legally obligated to first obtain a license (i.e. permission) to do so from the owner of the patent. The United States Patent Office, as well as the patent offices of foreign countries, have issued many thousands of patents for inventions relative to firearms, ammunition, accessories and supplies. The first U.S. Patent was granted on July 31, 1790, to Samuel Hopkins.

Paterson Colt a gun collector's term for the revolvers produced by Colt's Patent Fire Arms Manufacturing Company at Paterson, New Jersey in the period 1836–

1842, amounting to approximately 2000 pieces in calibers .28, .31, .34 and .36.

Patina a dark black, or greenish-black film found on copper, brass or bronze surfaces, caused by oxidation. This kind of surface is prized by knowledgeable antique collectors.

Patridge, E.E. (PAT ridge) former president of the United States Revolver Association, developer of the flat-top blade front sight and rectangular-notch rear open sight combination introduced in 1892 and generally used for handguns having replaced the Paine sights in popular favor with pistol shooters.

Patridge sight a thick front sight, flat on top, with a square notch rear sight, designed by E.E. Patridge in the late 1800's.

Patron the name given a paper cartridge when such cartridges were first used for pistols. It was also the name given to the boxes in which they were carried in the mid-16th century.

Patterns 1. the distribution of a series of shots fired with the same setting. 2. in the case of a shotgun, the distribution of the pellets from a single shot at a specified distance within a circle of certain diameter. For example, a pattern test of a 12 gauge gun with a full choke would be expressed as so many pellets within a 30-inch circle at 40 yards. Smaller gauges and 12 gauge guns with open chokes should be patterned at shorter ranges.

Pauly, Johannes Samuel (1766–c1820) also known as Jean Samuel and Samuel John Pauly. An English gunsmith and inventor, his best known invention being a breechloader he developed in the years 1808 to 1812, that represented the first needle gun and self consuming cartridge. The cartridge was ignited by a needle that pierced a paper detonating cap affixed to the cartridge. It preceded the Dreyse needle gun by about 30 years.

Pawl a movable piece in a mechanism, usually spring controlled, adapted to fall into notches on another movable piece, so that movement of such other pieces is limited to one direction only.

Peabody rifles using the breechblock system invented by Henry O. Peabody of Boston, Massachusetts, patented 1862, were known by this name.

Peabody, Henry O. an American inventor of a new breechlocking system that hinged the breechblock at the rear and above the axis of the barrel bore. His basic patent was granted in 1862.

Peacemaker the six-chambered .45 Colt Single Action Army Revolver first produced in 1872 and popularly known as the "Peacemaker", being much in favor with peace officers of the old West. Though occasionally interrupted, production of this model was continued by Colt until the 1970s.

Pedersen device a semiautomatic mechanism that could be used with a modified U.S. Springfield M1903 rifle to enable it to fire .30 caliber pistol cartridges. Developed by J.D. Pedersen in 1917, it was produced secretly for the U.S. Army for use in World War I. Subsequently, the device was held impractical and stock on hand destroyed.

Pedersen, John D. (–1951) an American gunsmith and inventor who, around 1927, developed a rifle and .276 caliber cartridge for it for the U.S. Army, although it was not officially adopted for use. Patented many firearms improvements. He developed the secret Pedersen device for use in World War I.

Peening the process of hammering a metal piece to indent and compress it, thus expanding or stretching it. A ball-peen hammer is used by gunsmiths for this operation.

peep sight

Peep sight a rear sight having a small hole to look through in aiming the gun of which it is a part. Also called an "aperture sight."

pellet

Pellet a small lead shot or small bullet.

Pellet lock See "pill lock."

Pellgun a registered trademark for air and CO_2 pellet guns.

Pendulum See "ballistic pendulum."

Penetration the distance to which a projectile will enter a designated substance.

Pennsylvania rifle a muzzleloading rifle in both flintlock and percussion designs, also called a Kentucky rifle.

Pentathlon, modern See "modern pentathlon."

Pentolite an explosive consisting of PETN (pentaery thritoltetranitrate) and TNT (trinitrotoluene).

Pepperbox a handgun having a cluster of barrels that revolve, each containing a charge. Made in the latter half of the 18th century and discontinued in the latter half of the 19th century.

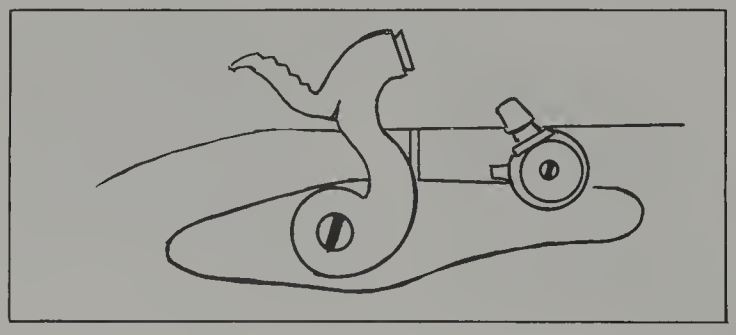
Percussion 1. the act of tapping sharply. 2. in the case of a firearm, the striking of the percussion cap to set off the propellent charge.

percussion cap

Percussion cap an early form of primer. The first were small metal caps containing the priming mixture that could be placed open end down over the nipple and in that position exploded by the blow of the hammer. A different form was the "maynard primer."

Percussion composition an explosive chemical mixture that may be set off by a sharp blow, such as the blow of a firing pin against a soft metal cap containing a percussion mixture.

Percussion hammer See "hammer."



percussion lock

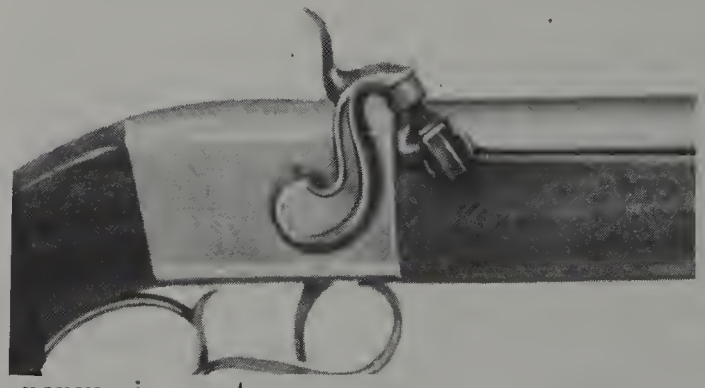
Percussion lock a firearms "lock" and ignition system that was designed to make use of one of the new percussion igniters that replaced the flintlock system. Percussion igniters evolved from a paper cap to a roll of caps, a tape, pellet and to a copper cup, before reaching the modern stage where it was formed into a primer in self-contained, "fixed" ammunition.

Percussion long arms many arms using the percussion system have been developed since the advent of that system, which displaced the mechanical system of producing a spark. By 1842, all British Brown Bess muskets in service were converted to percussion fire. In 1845, American sportsmen put percussion long arms in general use. With the acceptance of percussion arms came improvements in rifling, breech loading, repeating features and use of revolving cylinders.

percussion pistol

Percussion pistol adaptation of the percussion system opened the way for development of handguns to their present state. The first regulation U.S. percussion pistol was the Model 1842 design, but the Model 1843 was the first to be put in service. Both were .54 caliber smooth bores.

Percussion primer better known as percussion cap; a cap or cylinder containing a small charge of high explosive sensitive to a blow.



percussion system

Percussion system the method of igniting a propellent charge by chemical means, set in motion by a sharp blow from a firing pin or hammer against a chemically filled paper, cloth or metallic container.

Performance the degree of accuracy with which a gun or ammunition delivers a projectile to a target.

Perigee the lowest point in the orbit of a body around the earth. A non-circular orbit of a satellite has both an apogee and a perigee.

Petard (pi TARD) an ancient term for a container of explosives used to break into a walled fortification.

Peters an ammunition manufacturing division of Remington Arms Co., Inc., Bridgeport, Connecticut. The Peters Cartridge Company was originally founded by G.M. Peters in 1887 as a subsidiary of the King Powder Company of Kings Mills, Ohio. It was purchased by Remington Arms Company in 1934.

Petronel the name applied to a medium caliber carbine in the 16th and 17th century.

Phalanx a unit of armed foot soldiers in a tightly grouped battle formation. An ancient military formation best practiced by the Greeks and Romans, typified by joined shields and interlaced spears.

Phosphatizing a chemical process for creating a dull grey to black rust-resistant finish on steel. Widely used on military weapons prior to World War II. Also known as "Parkerizing" or "Bonderizing." Basically, this process consists of boiling steel components in a solution of phosphoric acid and water.

Photomicrography the science of taking photographs through high power microscopes. The resulting photograph is called a photomicrograph. Finds use in the science of metallurgy and in the identification of firearms.

Pi the Greek letter π used to denote the ratio of the circumference of a circle to its diameter. It has an infinite number of decimals, but in ordinary usage only the first four are used, that is, it is assumed to equal 3.1416.

Picatinny Arsenal a U.S. Army arsenal located near Dover, New Jersey, established in 1879, important as the source for every important development in artillery ammunition, bombs, explosives and pyrotechnics. Its pilot production lines have formed the models for rapid expansion of private industry in times of national emergency.

Picket bullet a bullet of conical shape having a flat nose. Also called a "sugarloaf" bullet.

Picric acid a high explosive more powerful than TNT, but since the introduction of TNT its use as a military explosive has decreased. It is used in mixtures with other nitro compounds; as a substitute for part of the mercury fulminate charge in detonators; and in converted form in the manufacture of explosive D as a booster explosive.

Piece a single firearm, such as a musket, rifle, carbine, shotgun or an artillery weapon. The origin of this term for a firearm is unknown.

Piezo gauge (pie EE zo) more correctly known as the Piezo quartz crystal gage, or the electric strain gage, used to measure the pressure developed by a fired cartridge in the barrel of a gun. It makes use of the principle that when pressure is applied to a quartz crystal in a certain direction to its grain, an electromotive force is developed which is in direct proportion to the pressure.

Pigeon See "clay pigeon."

Pigeon gun a special gun developed and used in the period 1810 to 1860 for the sport of pigeon shooting. Usually a single barrel, large bore muzzleloader. The present day pigeon gun is usually an over & under or side by side shotgun of 12 gauge having 30-inch barrels bored modified and full, or full and full.

Piling swivel the British term for stacking swivel.

Pillar breech a form of muzzleloading system used for a time during the first half of the 19th century. It was based on a breech plug that had a pin or pillar projecting from its center into the bore of the rifle. This pin was called a "tige." Loading the rifle consisted of dropping powder around the tige, so that the pin protruded above the surface of the powder where it would serve as an anvil against which a loose fitting bullet could be rammed and expanded to better engage the rifling.

Pill lock a percussion lock firearm employing fulminate pellets or pills, which in America gave rise to the name.

Pinfire a cartridge that appeared prior to 1850. It contained a cap containing fulminating powder against one side of the case and had a pin projecting outward from the case at the other side. When the hammer struck the pin, its inner end penetrated the cap and fired the cartridge.

Pinfire ignition system utilizes a pin that protrudes at a right angle from the cartridge case adjacent to its base. The pin within the case bears upon fulminate in a percussion cap. Invented by Lefaucheux and Houllier, Frenchmen, about 1836. Pinfire revolvers were used in the Civil War.

Pin, firing See "firing pin."

Pinion a gear having a small number of teeth designed to mesh with the teeth of a larger wheel or rack.

Pinning a condition that arises in a file when cuttings removed from the work clog or jam in the teeth of the file.

Pipe in addition to other meanings, also refers to the cone shaped cavity that forms in the ingot of steel as it cools from its molten state. Unless the portion of steel containing the pipe is discarded, it will consti-

tute a defect in the steel shapes fabricated from that portion of the ingot.

Pistol a handgun having a short barrel, adapted to be aimed and fired with one hand. Pistols may be single shot, repeating or self loading (semi-automatic). They do not have cylinders, as do revolvers, but they may have a cluster of revolving barrels as a form of "pepperbox."

Pistol belt a belt made to hold a pistol or revolver holster.

Pistol carbine a pistol with a detachable shoulder stock, so it can be fired from the shoulder or the hand, as the shooter may elect. Used as early as the mid-19th century.

Pistol grip adapter an accessory designed to enlarge the gripping surface of a revolver.

tance from the wall — this measured distance is called "pitch down", and is used to provide the shooter or gunsmith with a simple reference that correlates the relationship of butt angle with the line of sight.

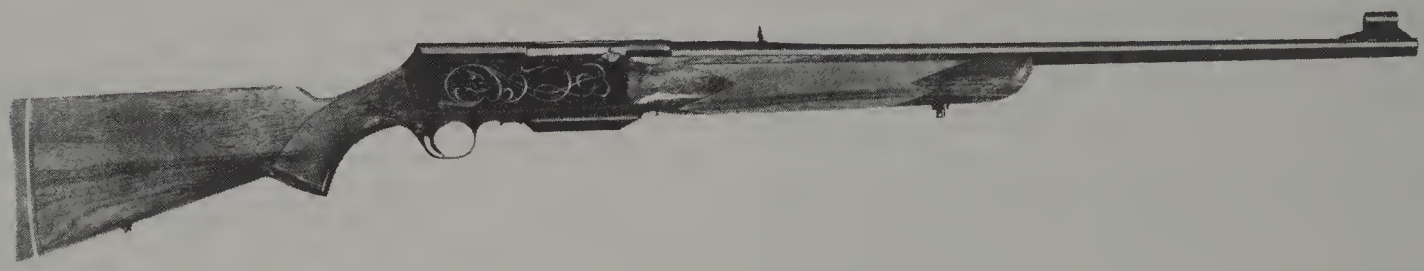
Pitted a term applied to a metal that has small indentations in its surface, caused by rust, acids or other harmful actions.

Pivot a point about which something turns.

Plains rifle an American percussion lock, muzzle-loading rifle, a development of the Kentucky rifle.

Plane of fire the vertical plane that contains the axis of the bore of a gun when it is ready to be fired.

Plane of sight the plane made by two lines, one from the muzzle of the gun to the target, the other line horizontal but perpendicular to the first line at the muzzle of the gun.



pistol grip stock

Pistol grip stock See "stock, pistol grip."

Pistol holster a sheath for holding a pistol, usually worn on a belt or carried on a saddle, made of leather, webbing or some other durable material.

Pitch 1. in the case of rifling, it means the angle at which the spiral is cut in relation to the axis of the bore and usually stated in terms of the number of inches of bore required for one complete spiral, i.e.,"one turn in 12 inches." Also called "twist." In the case of rifle and shotgun stocks, it is the angle at which the butt plate slopes in relation to the axis of the bore. See "pitch down." 2. in the case of handgun grips, the angle at which the grip slopes in relation to the axis of the bore.

Pitch down "pitch" (as described in the preceding definition for gunstocks) is the *angle* of the butt in relation to the axis of the bore. "Pitch down" is a measurement taken at the muzzle of the gun — a measurement that varies according to pitch. "Pitch down" is measured by resting the butt of the gun on a floor so that the butt lies flat on the floor surface and the muzzle points up. The gun is then moved toward a wall surface until the topmost portion of the receiver makes contact with the wall. When this occurs, it will be noted that the muzzle is still some dis-

Plastic explosive an explosive which, within normal ranges of temperature, is capable of being molded into desired shapes.

Plastics a term that covers many substances but commonly applies to synthetic moldable materials that fall into two general classes — the thermo-setting and the thermo-plastic. The first, when heated to curing temperature, undergoes a chemical change and usually results in a permanently hard, infusible and insoluble product. The second does not undergo a chemical change when heated and will soften on heating and solidify again when cooled below a certain temperature. Molded articles from this type can be remolded again when heated. Plastics are made in numerous compositions suited for an extensive variety of uses including, gunstocks, shotshell cases, grips, etc. The first thermosetting man-made plastic was invented and patented in the U.S. in 1909, by Dr. Leo H. Baekeland, and American.

Plate to overlay or coat with a thin metal layer.

Plating the process of applying a thin coat of metal to the surface of another material.

Plinker 1. a firearm (rifle or handgun) that is used for shooting at random novelty targets such as tin cans, etc. 2. one who practices "plinking."

Plinking the sport of shooting novelty targets at random distance with rifle or pistol.

Plug 1. an object used to stop up a hole or outlet. 2. a slang word for shooting a bullet into or at something. 3. a device that is used in scoring targets — employed when a given bullet hole is in questionable proximity to a scoring ring. See "scoring plug." 4. a magazine plug is a metal or wooden device that is inserted behind the follower of a tubular magazine shotgun in order to reduce overall shell capacity from five to three shots, in compliance with the Federal Migratory Bird Law.

Plumbago the common name for graphite.

Plunger the mechanism in a breech-loading gun that carries the firing pin into striking position.

Plywood glued together layers of wood arranged so that the grains of each layer are at right angles to the grains of the adjacent layers. Some gunstocks are made of plywood.

Pocket pistol a short-barrelled pistol designed for easy concealment.

Point 1. to aim or lay a gun on a target. 2. the tip of a projectile. 3. the name given to each of the clearly audible clicks heard when adjusting a sighting instrument with the value of a point varying according to the graduation of the instrument. Some instruments, usually European in origin, are not designed with an audible clicking device and, with these, a point would equal the spacing between two lines on whatever scale they are equipped with.

Pointblank range that range in which the curve of the trajectory is so slight that no allowance need be made in sighting for the drop of the projectile.

polishing

Pointed bullet a bullet whose shape is characterized by having a pointed nose.

Pointing lead (LEED) See "sustaining lead."

Point of fall a point in the curved path of a falling projectile that is level with the muzzle of the gun. Also called "level point."

Point of impact point at which a projectile first strikes.

Polarized light light whose vibrations lie only in one plane.

Polishing referring to metal polishing — as in the preparation of a firearm for blueing or anodizing. A soft cloth wheel treated with a fine abrasive, such as jeweler's rouge, is used for this purpose. The gloss and lustre of the final finish is dependent almost entirely upon the degree of preliminary polishing.

poly-choke

Poly-Choke the registered trademark for an adjustable choke device for single barrel shotguns manufactured by the Poly-Choke Company of Hartford, Connecticut.

Pomeroy, Seth (1706–1777) an American gunsmith who became the first Brigadier General in the Continental Army.

Pom-pom a name first applied to a then newly developed Maxim 37mm machine gun that came on the scene during the Boer War (1899–1902), coined by African natives in describing what it sounded like. Now a common name applied to multi-barrelled guns, especially those used on shipboard for anti-aircraft fire or in aircraft.

Pope machine rest useful for test firing older types of single shot rifles with heavy barrels, using cartridges of light recoil. Consists of two steel "V" blocks bolted to a heavy bench set in the ground, the rear block being adjustable in azimuth and elevation.

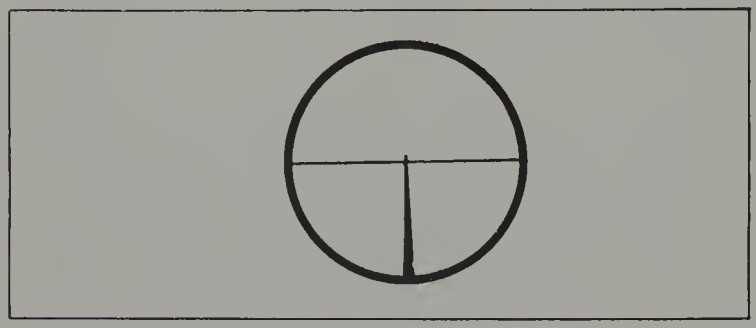
Pope rifling system a useful rifling system for lead alloy bullets, characterized by having the bullet of such diameter and the lands and grooves so designed that the periphery of the bullet contacts the top of the lands and the center of the flat bottom grooves.

Port an opening to permit the inlet or outlet of air, gas, or a liquid.

Porte tache a strap serving to carry a bullet pouch and powder flask and sometimes a spanner, and usually hung from the waist of the user. It's greatest use was just prior to and after the year 1700.

Position any one of the standard postures assumed by a shooter in firing a weapon. See "back," "prone," "sitting," "squatting," "kneeling" and "offhand" positions.

Positive lens a lens that causes light rays to converge.



post reticle

Post reticle a reticle that, instead of having visible crosshairs, is made with sight guide to resemble a front sight. Sometimes made in combination with a visible horizontal crosswire.

Post sight a front sight that projects upward, like a post, from the barrel of a gun.

Potassium chlorate also known as chlorate of potash, whose chemical symbol is $KC10_2$. A powerful oxidizing agent and a fire hazard with dry organic materials such as clothes, and with sulphur. Used in matches and pyrotechnics. An ingredient of the mixture patented in 1807 by Alexander Forsyth and called percussion powder by him. Combined with fulminate of mercury, it constitutes the major ingredients of Forsyth's priming mixture.

Potassium nitrate also known as nitrate of potash, saltpeter or niter, whose chemical symbol is "KNO_3." Used in matches, pyrotechnics and explosives. The first gunpowder was made with it in a mixture with sulphur, and charcoal.

Pot shot an easy shot, as, for example, one at close range, or a random or haphazard shot. See "snapshot" for distinction.

Pouch 1. a small bag for carrying ammunition. 2. relating to the muzzleloading era, leather pouches were used to carry bullets and patches. (Powder was carried in powder horns or flasks.)

Pounds per square inch the units used in the English system of measurement to denote the pressure exerted on a surface. In abbreviated form, psi.

Powder an explosive compound or mixture used as a propelling or bursting charge. Two general types are black powder and smokeless powder. Black powder can be ignited by friction, a spark or a heavy blow, while smokeless powder is insensitive to shock.

Powder bag a fabric container for holding the powder charge for separate loading artillery ammunition. The fabric is made of special silk or cotton cloth that is completely consumed by the explosion, so that hot ashes do not remain in the barrel to preignite the succeeding charge.

Powder black See "black powder."

Powder, blank See "blank powder."

Powder blast usually called muzzle blast. The surge of hot air and gases that rushes from the muzzle of a gun as the projectile leaves it.

Powder burn the burn that results from being in close proximity to the muzzle of a gun upon firing; caused by contact with burning powder particles.

Powder chamber that part of the bore of a gun adapted to receive and hold the propelling charge of separate loading artillery ammunition and where it is ignited.

Powder charge the measured quantity of powder used as the propellent in a cartridge case, shotgun shell or artillery piece.

Powder chest a container for the storage or shipment of powder, such as an airtight, zinc lined wooden box.

Powder deterioration assorted lots of smokeless powder will have useful lives of varying duration, depending upon their manufacture and the conditions of storage until used. Smokeless powder, a chemical compound, gives off nitrous oxide when decomposing — a highly corrosive gas and very poisonous if inhaled. Decomposing smokeless powder gets progressively weaker and harder to ignite and, in fixed ammunition, it has not proven dangerous though it could be if it gets so weak that bullets lodge in the bore.

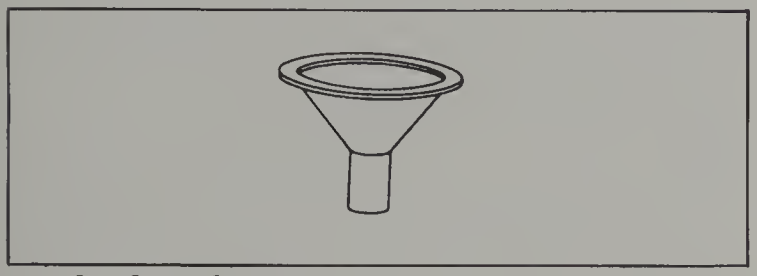
Powder, double base See "double base powder."

Powdered metal See "sintered metals."

powder flasks

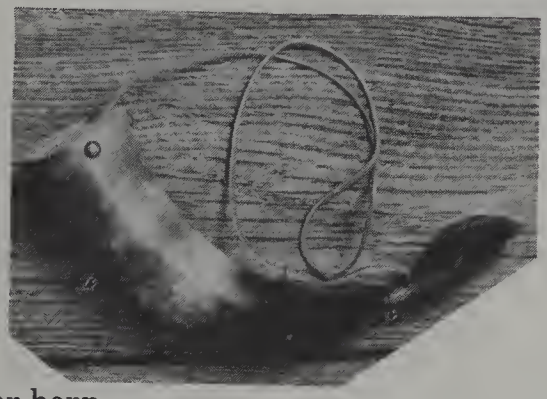
Powder flask a small, flat, narrow necked container for carrying gunpowder, usually made from non-ferrous metal or hard leather. First use believed to have been made in the early part of the 15th century.

Powder fouling the solid residue remaining in the bore of a gun after it has been fired. A more serious effect when black powder was used than with smokeless powder.



powder funnel

Powder funnel a funnel of such size that it may be used to conveniently fill a reconditioned cartridge case in the reloading process.



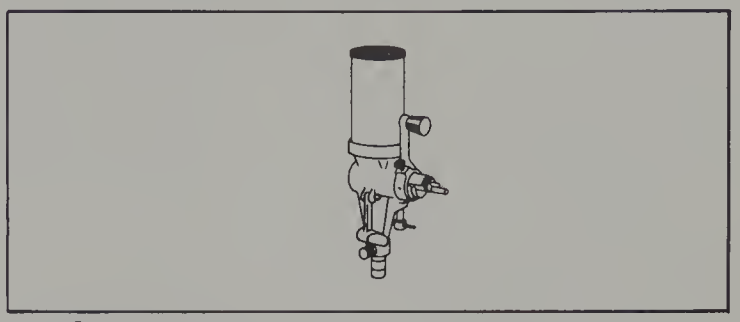
powder horn

Powder horn the horn of an animal made into a container for carrying gun powder. Used first in the beginning of the 18th century.

Powder keg a small barrel for storing and transporting gun powder.

Powder, Lesmok a discontinued DuPont semi-smokeless propellent powder made from nitrated wood cellulose, saltpeter, charcoal and sulphur. At one time widely used in charging .22 caliber match ammunition. A very sensitive and difficult powder to handle, Lesmok was considered even more dangerous than black powder.

Powder lot a batch of powder made at one time by the powder plant and, thus, every portion of it has identical characteristics. Batches may vary from several to many thousands of pounds. In packaging, the manufacturer's lot number is generally noted on each canister or container. In this way, different batches of the same powder are called to the user's attention.



powder measure

Powder measure a calibrated dipper or other type of container for measuring out a charge of powder by volume rather than weight.

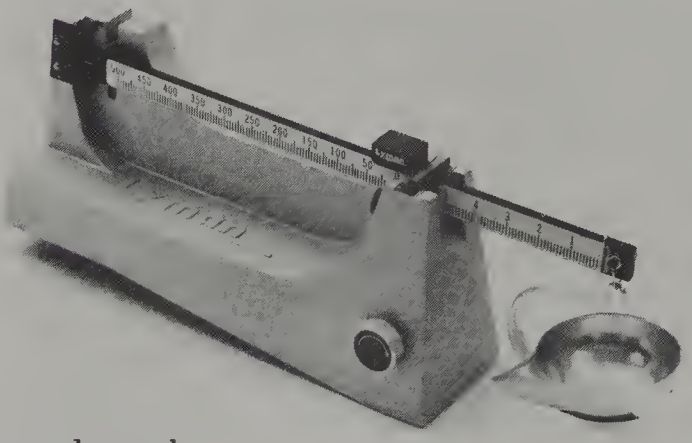
Powder metallurgy the art of forming articles of manufacture by subjecting powdered metal to intense heat and pressure.

Powder mill the name applied to a plant manufacturing powder or to the mechanical equipment used to shape the powder.

Powder, priming See "priming powder."

Powder, propellent See "propellent powder."

Powder room a room set apart for storage of powder, usually termed a magazine.



powder scale

Powder scale a balance scale for weighing powder charges, usually calibrated in grains of weight and frequently equipped to permit measurements as fine as tenths-of grains.

Powder shape for small arms, powders take several shapes: black powder is made up of small irregular lumps, better termed granules or pellets and not grains, since the latter is a unit of weight; smokeless powder is formed into small, thin flakes, very small

balls or small cylinders with a longitudinal hole, much like spaghetti.

Powder, single base See "single base powder."

Powder tester an apparatus for testing the strength of powder, the earliest known description of one written by William Bourne in 1587. He described a cylinder with a lid, that, when a powder charge was set off, was raised and remained so. The distance the lid was lifted gave a measure of relative powder strength and performance. In successive improvements, modern procedures and equipment were developed as exemplified by the pressure gage.

Powell a prominent British gunmaking firm established in Birmingham, England in 1802. Famous for its fine double barrel shotguns and double barrel rifles.

Power the capacity to perform an act, as in the case of the expanding gases of the ignited propellent powder, which have the capacity to propel a bullet. In optics, it is the degree to which the optical instrument magnifies.

Practice ammunition ammunition used for target practice. In the military services, lots of poorer grade ammunition are so designated and employed for basic training purposes. Civilian marksmen, however, are generally very careful to use ammunition comparable to what they expect to use in competition. Only with the .22 rimfire will they substitute standard velocity .22 long rifle cartridges for match .22lr's when practicing, primarily because these shells have proven almost as accurate at match ammo.

Practice fire target practice with live ammunition.

Preliminary firing practice firing undertaken before "record firing."

Prescribed load the combination of primer, powder and bullet recommended for a specific gun and bore size or shooting result.

Press a tool used in the reloading of small arms ammunition.

Pressure in a gun, is the force exerted by the rapidly expanding gases of combustion of the propellent powder. Many factors in the design of a gun and cartridge influence the pressure developed in a gun.

Pressure curve usually refers to a graphical illustration consisting of a continuous curve plotted on a time-and-energy graph to show the build up of pressure in the chamber of a gun when it is fired.

Pressure equivalents See Appendix.

Pressure gage a device for measuring the pressure developed in a gun barrel by the rapidly burning propellent powder. See "oiled case pressure gage," "Piezo gage," "radial pressure gage."

Pressure lock an improved form of matchlock, whereby the trigger releases a tumbler to revolve 90 degrees to bring the match in contact with the priming charge. Some still used in the 20th century in parts of Asia and Africa.

Primer 1. the detonating mixture that ignites the propellent powder. 2. the detonating mixture together with its container or holder.

Primer, Berdan See "Berdan primer."

Primer blow-back is the term applied when a section of the primer opposite the firing pin is blown out by the gas pressure of the exploding propellent. May be caused by a weak main spring, a firing pin that is too light, excessive pressure or a firing pin that is too sharply pointed.

Primer, Boxer See "Boxer primer."

Primer cup the receptacle that holds the priming mixture and anvil. It is seated in the base of the cartridge case, or in the battery cup in the case of a shotgun shell, which in turn is seated in the base of the shell.

primer flipper

Primer flipper a plastic tray-like device, having a cover, for aligning tumbled primers in one direction so that they are more easily loaded into an automatic priming feed.

Primer leak a defect in a cartridge which permits partial escape of hot propelling gases thru a primer, caused by faulty construction, an excessive charge, or an oversize firing pin. Black marks around the primer indicate the leakage.

Primer pocket the receptacle in the base of a cartridge case or shell for receiving and holding the primer or primer cup.

Primer seat the chamber in the breech mechanism of a gun that uses separate loading ammunition, into which the primer is set.

Primer setback 1. the term applied to a system used in a relatively small number of automatic weapons, wherein the primer sets back against the bolt, thus pushing a plunger mounted in the bolt face to the rear to unlock the mechanism. 2. the loosening, or partial dislodging, of the primer from the primer pocket of a cartridge case. An occurrence that points to a faulty bolt, defective cartridge, excessive powder charge, or defective chamber. Also occasionally resulting from the use of unusually heavy loads.

Priming mixture the tiny, highly combustible and explosive charge that is used in percussion caps and primers to ignite the main powder charge in fixed ammunition. Primers are no doubt the most dangerous component in small arms ammunition — the hardened paste mixture is so sensitive that it is easily set off by a slight blow. When the forerunner of the modern priming mixture was invented by the Rev. Alexander John Forsyth in 1805, the inventor chose to call it "detonating powder." Others, because of its unpredictable and often disastrous nature, simply referred to it as the "devil-mixture." The earliest priming mixtures were comprised principally of fulminate of mercury. Later, improved mixtures added chlorate of potash and powdered glass and, when fulminate of mercury was found to have a highly corrosive effect on brass cases, a mixture of potassium chlorate and antimony sulphide was substituted. Formulas for modern priming mixtures vary from one manufacturer to another, but at least some of the following chemicals figure prominently in most of them: sulphur, lead or copper sulphocyanide, TNT, tetryl, barium peroxide, barium nitrate and lead peroxide.

Priming pan See "pan."

Priming powder gunpowder placed in the pan of a matchlock, wheellock or flintlock, used to set off the propelling charge.

Priming tube a storage tube for new primers, generally attached to the loading press, designed to facilitate the rapid feeding of single primers to the primer loading device.

Prism in optics, a transparent, light refracting body having two plane surfaces which are not parallel. Used in such devices as binoculars to change the direction of light rays, so that the eyepiece lens need not be in alignment with the objective lens.

Prismatic any optical instrument, such as a binocular, camera or telescope, that makes use of a prism or prisms.

Profile the outline, contour or silhouette of a firearm or portion of a firearm. In manufacturing, there is a machine called a "profiler" that cuts two or more copies from an original master, often employed in stock making.

Projectile generally any object projected by an exterior force and continuing to travel by its own inertia. In the firearms usage, it is any object fired from a weapon by the force of an explosive propelling charge. Ballistically, such an object does not become a projectile until it is in flight.

prone position, rifle

Prone position, pistol as prescribed in U.S. Army and Air Force training, the shooter lies flat on the ground with his legs straight and feet together, with head and body on a line with the target. With two hand grip (or if sights cannot be properly aligned, a one hand grip, supporting the revolver on a fist made with the free hand), the arms are extended and gun pointed toward the target. The chest and forearms rest on the ground.

Prone position, rifle the disposition of the body of a rifleman when he shoots from the ground. The stomach is flat upon the ground, the legs spread, the insides of the feet flat on the ground, with head and shoulders raised and supported by the elbows, leaving the hands free to hold and operate the rifle.

Proof cartridge a cartridge loaded to give a breech pressure about 25% greater than the pressure developed by the heaviest commercially available shell for the same caliber. The proof cartridge is used to test a new or repaired firearm for strength and safety.

Proof charge used to test the strength of a gun. It is a charge that is approximately one-fourth greater in

pressure than the normal pressure intended for use in a specific gun.

Proof fire to "prove" the strength and safety of a firearm by testing with a "proof cartridge."

Proof firing the act of test firing a firearm with a "proof cartridge." Because proof firing is done with a heavily overloaded cartridge, the tested firearm is never held in the hands but in a mechanical shooting device. The operator is screened by heavy protective plates.

Proof house most foreign gun-making countries are signatories of an international proof-testing agreement that establishes the standards for governmental testing of newly made firearms: the United States being a notable exception. Under their international agreement, foreign gun makers must submit their wares for testing to a government-operated proof house at scheduled stages during manufacture and, again, when each individual firearm is completely finished and assembled, ready for market. For this reason, firearms made abroad generally carry a number of proof markings which are stamped into the metal in the vicinity of the breech. Often, firearms made in the U.S. must be submitted by their importers for proof testing before they can be offered for sale in a foreign country. In the U.S., because of traditionally high industry standards, there has been no need for governmental regulation and each manufacturer proof tests his own wares before releasing them for sale.

Proof load See "proof cartridge."

Proof mark the distinctive stamp of acceptance pressed into the metal of a firearm by the testing government proof house (foreign) or by the manufacturer (U.S.). This mark indicates that the firearm has been successfully tested with a proof cartridge and that it may safely be used with commercially available ammunition of the appropriate caliber.

Proof test a pressure test of a gun to determine if it can withstand pressures substantially higher than those to which it will be subjected when standard ammunition is used. In the United States, manufacturers place proof marks on their guns as evidence of the proof test having been made. In many foreign countries, government proof houses perform the function of testing and marking.

Propellent something capable of imparting motion to an inert body; such as the powder charge in a cartridge which, when ignited, propels the bullet. The word "propellent" may be used either as an adjective or a noun, the word "propellant" is used only as a noun.

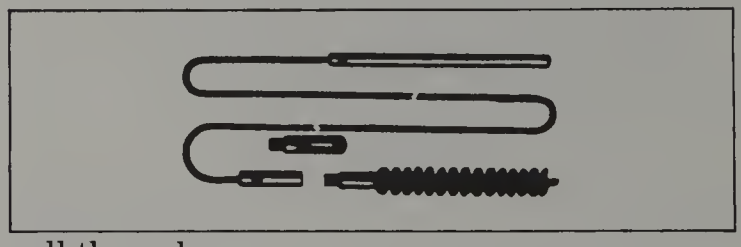
Propellent powder the powder used in a gun to propel a projectile. Requirements for a propellent powder are that it burn quickly and at a controllable rate in a confined space. Black powder and smokeless powder meet these requirements and, by the sudden expansion of the gases they give off on burning, create the pressures needed to propel a projectile.

Prussian blue a color pigment discovered in 1704 by a Berlin colormaker. Chemically known as ferric ferro-cyanide. The dark blue powder is used on barrels being fitted to stocks to mark the uneven stock surfaces that require finishing and smoothing.

Psi abbreviation for pounds per square inch.

P 38 the popular term for the Model 38, 9mm, eight shot, double action, locked breech, semiautomatic pistol, a World War II standard of the German Army. It subsequently was adopted as a standard sidearm by the West German Army. Its design evolved from the Walther HP commercial pistol.

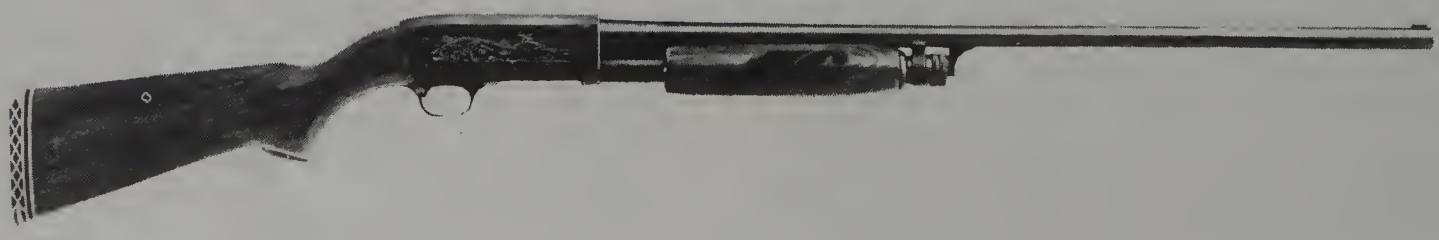
Pull! the signal given by the shooter when calling for a target in skeet or trap-shooting. Some skeet shooters also use the term "mark" when calling for one bird and "pull" for the second, when shooting two birds from one station as singles targets.



pull through

Pull-through a cord, cable or chain having a brush or cleaning patch holder at one end, used to clean the bore of a firearm by drawing it through the bore.

Pump gun a repeating rifle or shotgun that is operated by means of a sliding forearm. Linked to the breech block mechanism, the sliding forearm — by



pump gun

means of a back and forth stroke — opens and closes the breech, thereby ejecting the spent round and chambering a fresh round. The hammer is simultaneously cocked for subsequent firing. Also known as a "slide-action" or "trombone action."

Pumpkin ball a round lead ball used in shotguns for hunting deer, now almost entirely replaced by rifled slugs for that purpose.

Punch a tool used to drive a hole in a surface, or the act of doing so.

Punctured primer, pierced primer results from the hole made by the point of a firing pin and is indicative of improper correlation of firing pin and primer.

Punkins, punkin shells a local term for pumpkin balls.

Punt gun a large bore gun of approximately 4 gauge, which was mounted on the front of a small boat when waterfowl hunting. Originally developed in England, punt-guns were widely used in the U.S. during the era of the market hunter. Conservation legislation and, particularly, the Federal Migratory Bird Act have now rendered them illegal.

Pyrites sulphide of iron, a mineral that gives off sparks when it strikes iron or steel. Used in early wheellock guns and in the first of the flintlocks, being replaced by "flint" for ignition systems.

Pyrites lock a firearm type that appeared between the wheellock and snaphaunce periods. The cock terminated in a pair of jaws that held the pyrites. A sweeping motion of the pyrites against the steel of the frizzen produced the sparks that ignited the priming powder.

Pyrodex powder a newly developed propellent gun powder by the B.F. Hodgdon Company of Kansas. Designed to replace black powder in muzzleloading pursuits, it is substituted for black powder on a volume-for-volume basis (not weight). Offering a number of significant advantages, it is classified as a "flammable solid" (not explosive) and is thus easier and safer to ship. It also somewhat minimizes bore sludge and is less hygroscopic. Its only apparent disadvantage is that it has a somewhat higher flash point and cannot be used as a priming charge in flintlocks.

Pyropowder a type of nitrocellulose powder used as a smokeless propelling charge and having a smaller nitrogen content than gun cotton. It is a single base powder.

push-button safety

Push-button safety a very functional and popular form of safety device that is found on many different types of firearms. A push-button safety is just what the name implies — a button-like device that is pushed to lock or unlock the firing mechanism. Usually located in the trigger guard immediately behind the trigger.

Push down trigger is a stud, rod or lever set into a gun and which is depressed to discharge it. As a substitute for the conventional trigger, it failed to achieve success.

Pyramid sight a front sight that projects above the barrel of a gun and is triangular or pyramidal shape.

Pyrocellulose a nitrocellulose having a lower nitration than guncotton, used in smokeless powder propellents. Also called pyrocotton.

Pyrometer an instrument for measuring temperatures from about 300 degrees Fahrenheit upward.

Pyrotechnic pistol a pistol designed to fire flares or other firework signals.

Pyrotechnics 1. the art and science of making fireworks. 2. fireworks or a display resembling fireworks.

Q

Qualification course practice firing for record to determine the degree of skill of a shooter as measured by his score.

Qualified a shooter who has fired for record under proper supervision and been rated according to his skill. Recognized military ratings are marksman, sharpshooter, expert.

Qualify to qualify is to undertake practice firing for record, under proper supervision and conditions, to ascertain the degree of skill of a shooter as measured by his score.

Quarter point of windage one fourth of the distance between two lines of an iron sight sliding scale found on many military rifles, including the U.S. caliber .30, M1903A3 and the U.S. Caliber .30, M1. Each quarter point represents ¼th minute of angle. The adjusting screw is arranged to click with each quarter point of movement. Adjustable rear sights on the U.S. M14 and M16 rifles "click" for both elevation and windage adjustments, each click representing, as does the quarter point, ¼th minute of angle.

Quenching baths a bath of water, salt brine or one of a number of different oils alone or in various combinations used to quickly cool and thus harden heated steel. The effect of a bath upon steel depends upon its composition, temperature and volume, its heat dissipating quality largely determining what liquid is to be used for given kinds of steel.

Quick draw is the practice of reaching for, and quickly producing, ready to fire, a revolver from its holster or place of concealment on the person. Today, the term can also be used when referring to the "draw" of a pistol. Although the sport of quick-draw was originally called just that, over the years the term "fast draw" has replaced it and is the more commonly employed term today. See "fast draw."

Quick fire very fast firing, faster than rapid fire, and used against moving or bobbing targets.

Quick kill a term coined by the military to describe training in the shooting of a weapon by instinctive pointing; based on the theory that where the extended arm points, so will the weapon.

Quick match a fast-burning fuse made from a cord impregnated with black powder, used in flares and pyrotechnic display devices.

Quicksilver the common name for the silvery metallic element mercury, whose chemical symbol is Hg, which is in liquid form at atmospheric pressure and ordinary temperatures. Commonly used in thermometers and other instruments, its significance to the firearms art is the fact that one of its salts, mercuric fulminate, is a widely used detonator. Gunsmiths, too, have found use for mercury as a hardening agent.

R

Rack See "gun rack."

Radial pressure gage a type of gage for measuring the pressure developed in a gun by the expanding gases of an exploding propellent charge. Basically, it consists of a copper cylinder (for low pressures, a lead cylinder) that is crushed between an anvil and a piston that is forced against the cylinder by the gas pressure. The amount of shortening of the cylinder is indicative of the pressure. See "Piezo gage," "pressure gage," and "oiled case pressure gage."

Radiation of heat is the emission of energy from a heated body. In firearms, the heat developed is insulated from the shooter by the forearm and dissipated from the barrel.

Radom a 9mm, 8 shot semi-automatic pistol adopted by the Polish military in 1935.

Rail mount a type of riflescope mount made with female dovetails to accommodate a railed scope. This form of telescope mounting has been practiced in Europe for quite a number of years but has never really attained acceptance in the U.S., where the traditional ring mount enjoys unimpaired popularity.

Rail scope a riflescope made with an integral rail (male dovetail). This is used in conjunction with a "rail mount" which, instead of the traditional American ring arrangement, employs a pair of female dovetail bases. Rail scopes and rail mounts are widely used in Europe but have never managed to gain ac-

rail scope

ceptance in the U.S.

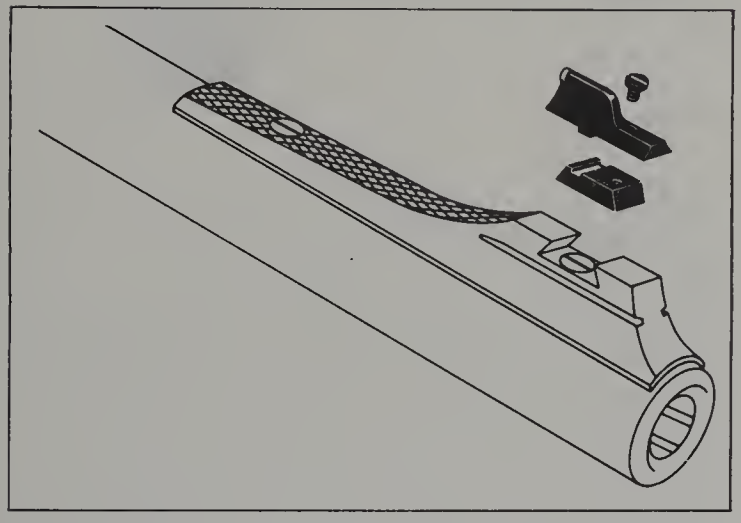
Raise pistol the military command to remove the pistol from its holster and hold it muzzle upward, as high as the right shoulder and about six inches in front of it.

Ram to push into position, such as seating a projectile in the chamber of a gun.

Rammer as to a small arm, a ramrod hinged to the weapon so it can be used without detaching it from the gun. In a reloading tool, a plunger generally mounted on a stand and used to seat a charge, as with a ramrod.

Ramp an elevated base for a front sight, made with a tapered foresurface that provides a gently sloping line to the barrel. In silhouette, the combination is pleasing to the eye.

Rampart gun See "wall gun."



ramp sight

Ramp sight a sight that is designated for use on a ramp. Made with a narrow male dovetail so that the sight base does not protrude beyond the width of the ramp.

Ramrod a metal or wood rod used to ram the wad and bullet, or shot, down the barrel of a muzzleloading firearm to position them on the powder charge. Sometimes improperly used in referring to a cleaning rod.

Range 1. a place where shooting is practiced. 2. the distance of travel of a projectile to a specified location expressed, such as "maximum range," "effective range," "point-blank range," etc.

Range deviation the distance by which a projectile strikes beyond or falls short of the target. Also called "longitudinal deviation" or "vertical deviation."

Range discipline orderly conduct on the range in obedience to range rules and regulations.

Range finder 1. an optical instrument used to determine the distance from a gun to a target. Common types are the stereoscopic range finder and the coincidence range finder. 2. a type of reticle employed in rifle scopes that enables the shooter to make range estimates.

Range flag a danger-warning flag flown on a target range to indicate that the range is in use.

Range guard a person designated to keep people away from a target range while firing is going on.

Range indicator a placard or sign displaying the distance, in yards, from the firing point to the target.

Range officer one in charge of a target range. It is the range officer's responsibility to see that the range is properly maintained and operated, and that all safety regulations are observed.

Rapid fire a rate of fire practiced in target competition in which the shooter is most severely handicapped by the time within which to complete a prescribed course of fire. For example, in rapid fire handgun competition, the shooter is usually permitted only two seconds per shot, firing a string of five shots in ten seconds.

Rapid fire weapon any gun capable of being fired rapidly.

Rappahanock Forge a small arms manufacturing plant established by act of the Virginia Assembly, June 1775, near Fredericksburg, Virginia, and which produced small arms until about May 30, 1781, when it was dismantled to avoid destruction by a British raiding party.

Rasp See "barrelling rasp."

Ratchet a pivoting member adopted to engage notches in another member (such as a wheel) so as to permit motion in one direction only.

Rate of fire the number of shots per minute capable of being fired by a given weapon.

Rate of twist pertains to rifled barrels; rate of twist is the number of inches required for the rifling to make one complete revolution. This is written, for example, as "one in ten" or "1-10", meaning the rifling makes one complete revolution in ten inches. Bullet weight and anticipated bullet speed are the governing factors in determining twist rate. Rifling that is too fast or too slow will fail to impart stable flight to the bullet and will result in loss of accuracy.

Rawhide hammer See "soft hammers."

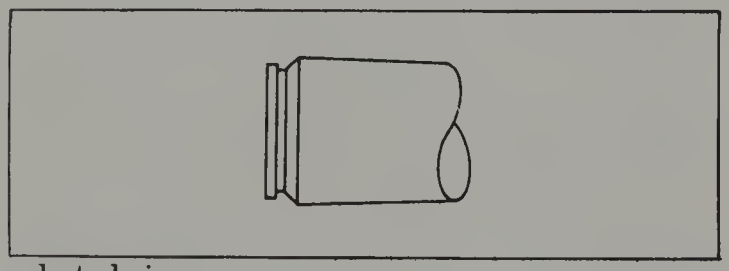
Ready position the position in which a weapon is held just before aiming.

Real image the image formed by the convergence of light rays through an optical instrument.

Reamer a cutting tool designed for enlarging drilled holes.

Rearm 1. to refuze a bomb or projectile to place it in proper condition to explode upon impact or at a predetermined time. 2. to re-equip with a weapon or weapons.

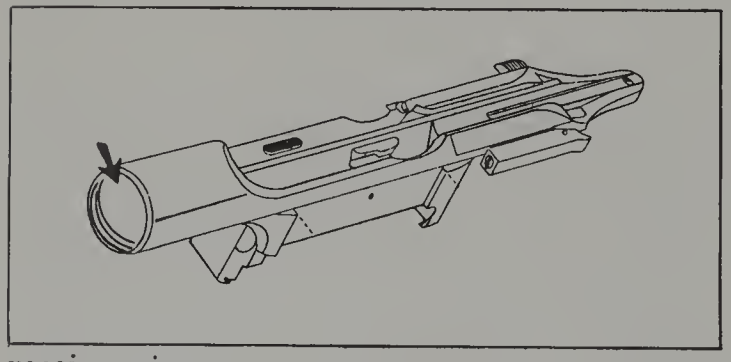
Rear sight the sight mounted nearest the breech of the gun that is used in conjunction with the front sight to enable the shooter to establish a "line of sight."



rebated rim

Rebated rim a type of cartridge case that has a rim diameter smaller than the diameter of the case.

Rebounding lock a type of revolver firing mechanism made with a rebounding hammer and firing pin. Immediately after firing and upon release of trigger pressure, spring tension acts to retract the firing pin and hammer. A *non-rebounding* lock frequently permits the firing pin to stick in the primer indentation which, in turn, prevents subsequent rotation of the cylinder and results in jamming. Rebounding locks tend to eliminate jams of this kind.



receiver ring

Receiver the part of a gun that takes the charge from the magazine and holds it until it is seated in the breech. Specifically, the metal part of a gun that houses the breech action and firing mechanism; in revolvers and hinge frame shotguns called the "frame"; in some types of autoloading pistols, the terms "frame" and "receiver" are used synonymously.

Receiver bridge the rear part of a receiver which extends partially or completely over the bolt or breech block. The solid type is typified by the Mauser bolt action rifle, the split type by the Krag-Jorgenson rifle.

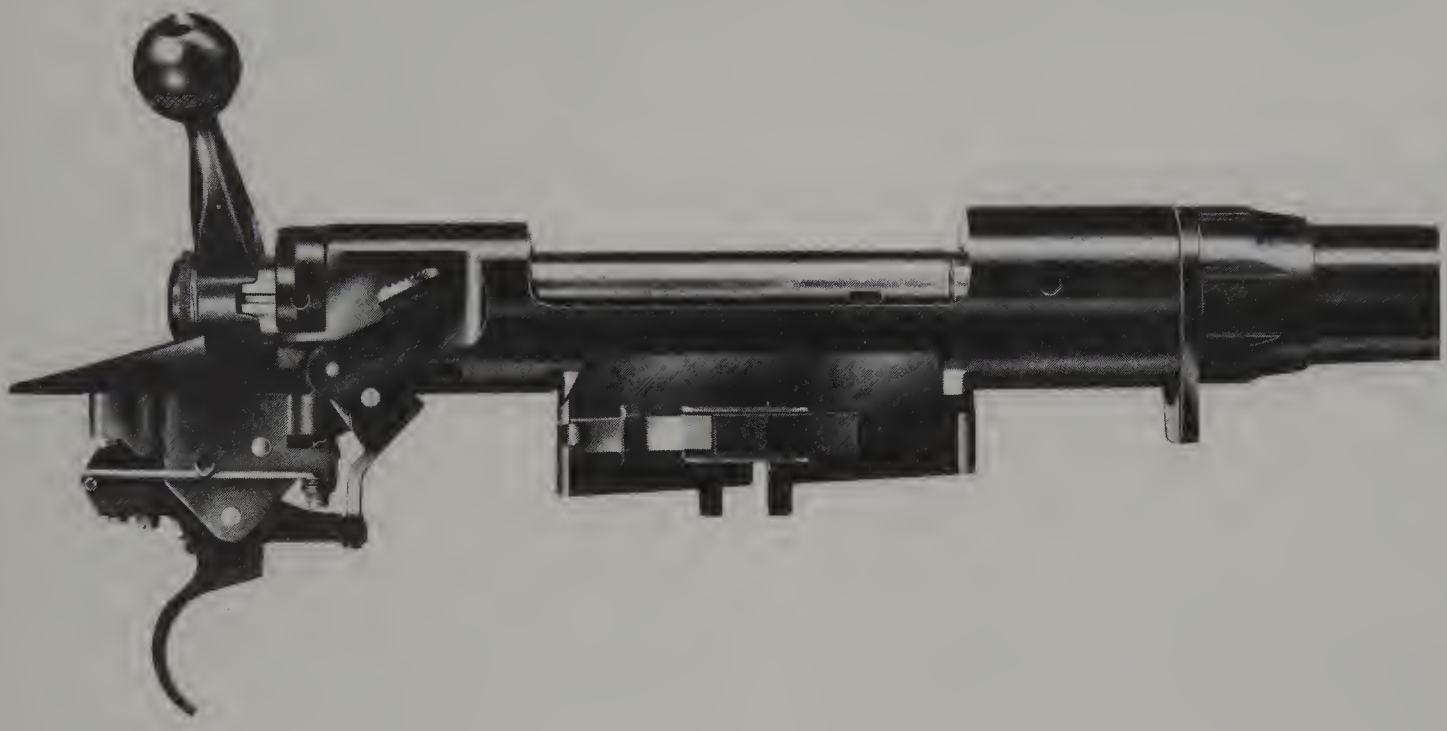
Receiver ring the cylindrical forward portion of a receiver into which the barrel is fitted. Rifles with forward locking lugs may have locking lug recesses in the receiver ring. The British term this ring a "threaded hood."

receiver sight

Receiver sight an adjustable, aperture-type rear sight fastened to the receiver of a firearm.

Rechamber to cut a new chamber in the barrel of a firearm by resizing its chamber; frequently employed to enlarge a weapon's case capacity without changing its bore size. Also, in rare instances, rechambering will permit a reduction in case size when barrel wall dimensions are such that the barrel can be set back. Similarly, guns with good rifling but with eroded or faulty chambers can sometimes be corrected by the same process.

Recoil 1. the rearward movement of a gun produced by its discharge. The effect upon a shooter is due largely to the weight and velocity of the bullet, the weight of the rifle and the design of the stock. The greater the weight of the bullet and the higher its velocity, the greater the effect or kick. Increase in rifle weight decreases the kick. Stocks designed to take recoil in a straight line are easier on the shooter than those with excessive cast or pitch. Gently sloped cheek pieces tend to draw away from contact with the face when recoiling. 2. the distance through which a gun recoils.



recoil lug

Recoil actions are used in semiautomatic firearms and rely upon the recoil of certain parts to eject a fired case and reload the gun. The simplest form is the blowback. Other types are the retarded blowback, blow forward, short recoil and long recoil, employed with various modifications and refinements.

Recoil calculation is accomplished by means of a formula that relates the weight of the propelled material and its muzzle velocity to the weight of the gun. See Appendix.

Recoil climb the upward swing of a firearm upon discharge due to the action of the recoil. The gun rises because the axis of the bore is above the mass-center of the gun, about which it tends to swing, as well as above the buttplate or handgun stock, where recoil is resisted. The bore axis, being also above the mass-center of the shooter, causes further upward tendencies, especially when firing is done from a standing position.

Recoil cylinder a fixed cylinder containing a piston attached to the barrel of a gun filled with either air or fluid, or both. When the gun is fired, the piston is forced backward against the resistance of the air or fluid or springs, the air or fluid being permitted to pass at a predetermined rate through holes in the piston.

Recoil, initial recoil before the bullet leaves the muzzle during which a small arm moves a very small fraction of an inch.

Recoilless the term applied to certain weapons employing high velocity gas ports to counteract recoil.

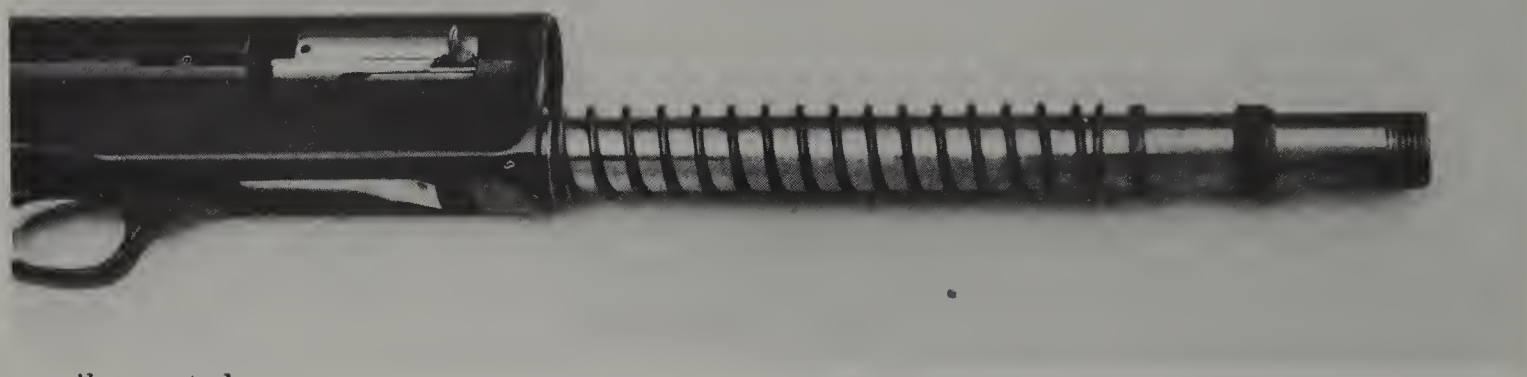
Recoilless rifle a projectile firing weapon in which the rearward movement resulting from firing is essentially eliminated.

Recoil lug a projection on the bottom of the receiver of a shoulder arm that bears against a matching surface of the stock, called the recoil shoulder, and transmits the recoil of firing to the stock.

Recoil mechanism a mechanism designed in cannon for the purpose of absorbing the energy of recoil

gradually, so as to avoid violent movement of the carriage or mount. Designed in automatic, semi-automatic or selfloading weapons to perform the functions of ejecting an empty case, reloading a fresh cartridge into the chamber and restoring the weapon to a firing attitude.

Recoil movement the rearward movement of a gun which starts when it is fired and reaches a maximum when the projectile has left the muzzle a short distance.



recoil operated

Recoil operated in an automatic or semi-automatic firearm, the use of a barrel and breechblock locked together at the instant of firing so that, for a short distance, both are forced rearward by the expanding gases of the exploding propellent powder. Then the barrel is unlocked, permitting the breechblock to continue rearward, ejecting the empty case and preparing for reloading. The initial locking of these parts distinguishes this system from the "blowback action."

Recoil plate See "recoil shield."

Recoil shield in a revolver, it is a flange on the standing breech to prevent cartridges in the chambers of the cylinder from moving backward far enough to interfere with the rotation of the cylinder.

Recoil shoulder See "recoil lug."

Recoil spring in an autoloading or automatic weapon, it is the spring that is compressed by the recoiling action of the barrel and/or breechblock. When the pressure of the expanding gases has subsided, the decompressing recoil spring returns the barrel and breechblock to a firing attitude. The entire sequence takes but a fraction of a second and is too fast for the eye to follow. Nevertheless, in this brief period, a spent casing is ejected, a fresh round chambered and, the hammer cocked for subsequent firing.

Recoil tables tables that show recoil velocity and recoil energy for specified cartridges fired from certain guns.

Record firing firing of a weapon for the purpose of qualifying for a rating and establishing a score.

Record practice practice firing for which a record is kept of the scores made, to provide a basis for marksmanship classification or qualification.

Reduced charge ammunition that has a less than normal propelling charge.

Reduce jam the act of safely removing a cartridge from a gun after it has failed to seat properly in the chamber or, of removing a fired case after it has failed to eject.

Re-entry match a target competition in which the competitor is permitted to fire more than one score for record; one or more of his best scores are then used to determine his final ranking.

Reference gages See "master gages."

Reflex response to a stimulus, such as flinching at the discharge of a gun.

Reflex shooting aiming and firing a firearm so quickly that the motion seems automatic.

Refraction the bending of a ray of light, deflecting it from a straight path. Caused by passing it obliquely from one medium to another, as when passing it through an optical surface, or water, etc.

Reising a caliber .45 submachine gun having a 20 round capacity, used by the United States in World War II, developed by Eugene Reising.

Release trigger a most unusual and widely frowned upon trigger mechanism occasionally found in target grade shotguns. Unlike the conventional trigger which fires a gun upon being pulled rearward, the release trigger fires upon being released, as it starts its forward, return motion.

Relief engraving (more properly termed bas-relief). In gunmaking, it is the carving of raised figures in the surface of metal so that they appear three dimensional. Sometimes referred to as deep-relief engraving. As opposed to line engraving.

relief engraving

Reload 1. place a fresh round or charge in a gun. 2. to assemble a new round starting with a used cartridge case.

Reloading (also known as handloading) is the recharging of a fired (spent) center-fire rifle, pistol or shotshell casing. In recent years, the development of economical and efficient loading equipment, together with cost savings over factory ammo and the utilization of painstaking loading techniques, has resulted in considerable growth in the practice of reloading.

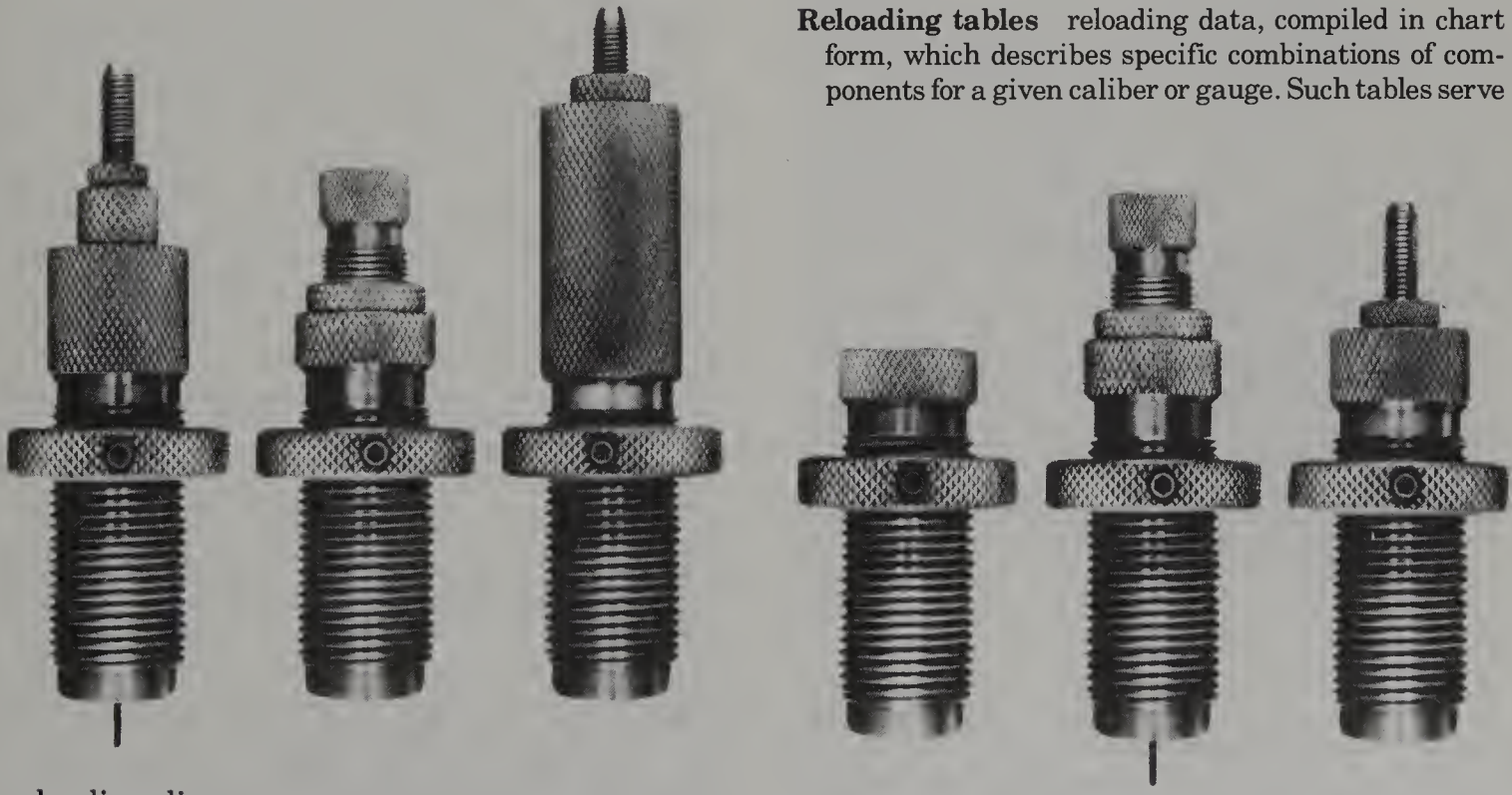
Reloading components the materials required to reload used cartridge casings i.e., primers, powders, bullets, wads, lead shot.

Reloading dies the dies or fixtures which comprise that portion of a reloading tool that actually forms and charges the casings.

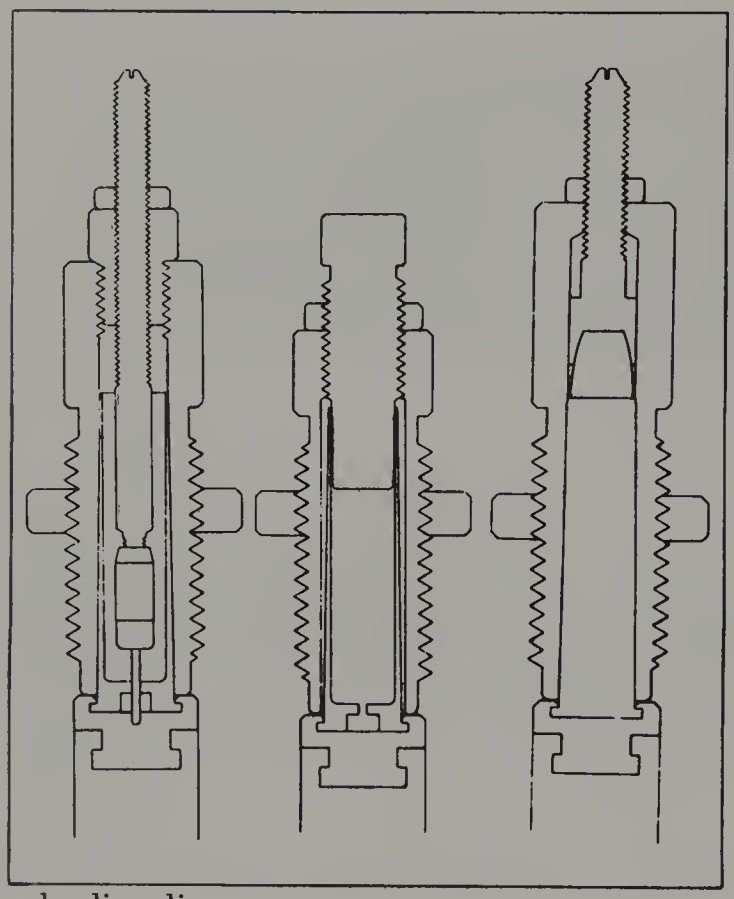
Reloading powders propellent powders which are manufactured for the recharging of used casings by handloaders.

Reloading press the tool that holds the reloading dies and that provides the mechanical leverage and pressure required to shape and charge cartridge cases.

Reloading tables reloading data, compiled in chart form, which describes specific combinations of components for a given caliber or gauge. Such tables serve



reloading dies



reloading dies

reloading press

to guide the reloader by telling him precisely what type of powder to use, weight of powder charge in grains, and bullet style and weight. Comprehensive tables will even recommend the use of specific primers and will advise approximate muzzle velocities and chamber pressures to be expected from a given load. When using reloading tables, it is important that all recommendations be followed exactly.

Reloading tools a broad title applicable to any or all of the dies, presses and miscellaneous accessories used in reloading ammunition.

Reloads used cartridge casings that have been reloaded for re-use.

Remaining velocity the speed of a projectile at any point on its trajectory.

Remington the trademark for firearms made by Remington Arms Co., Inc., the founder of which was Eliphalet Remington in 1816. The revolver produced in 1859 became very popular, as did the single shot, black powder, rolling block military rifle, which was used in the period 1870 to 1900, in various calibers, by a number of nations, including the United States.

Remington, Eliphalet (1793–1861) an American firearms manufacturer whose name continues to be part of the name of a present day manufacturer. The revolver he brought out in 1859 was extremely popular because of its strong frame and simple design.

Removable liner a removable rifled cylinder, fitted in a gun tube, so designed that when worn it may be replaced.

Repeater a gun capable of being fired several times without reloading. Usually applied to rifles and carbines.

Report the sound made when a gun is discharged, caused by the sound waves created by the muzzle blast. At supersonic speeds, a projectile will create a bow wave and its own sonic sharp distinctive crack that, at a distance forward of the gun, may be distinguished from the primary report.

Reseat to seat again as with replacing a bullet in a cartridge case.

Residual pressure the pressure still found in the chamber after the bullet has left the gun. It is employed in "blowback actions" to impart rearward motion to the breechblock.

Resistance welding See "welding."

Resolution the degree of image definition achieved by an optical instrument.

Resolving power the ability of an optical instrument to form separate images of closely related objects, sometimes called "definition."

Rest any support used to hold a gun steady while aiming and firing. See "bench rest," "machine rest," "Mann 'V' rest," "Pope rest," and "Woodworth cradle rest."

Rest, bench See "bench rest."

Rest, machine See "machine rest."

Rest, Mann "V" See "Mann 'V' Rest."

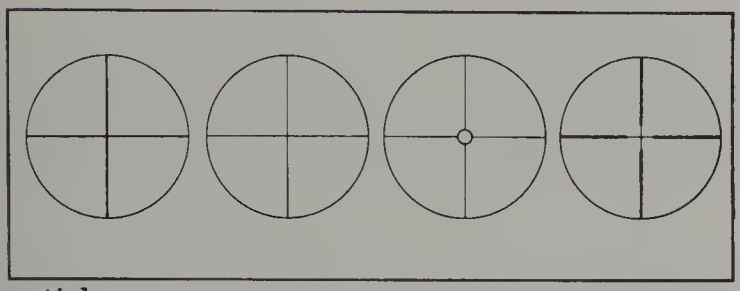
Rest, Pope See "Pope rest."

Restricted match a match limited to specific classes of shooters.

Retainer a member for holding one or more other members of an assembly in an assigned place.

Retaining catch the British term for bolt stop.

Retarded blowback action, delayed blowback action terms usually applied to those actions that retard the backward movement of the bolt or block by mechanical means whereby, initially, maximum resistance is offered to the breech pressure, so that the blowback movement is relatively slow while the bullet is leaving the barrel. The .276 Pedersen rifle, with its toggle connected breechblock, has such an action.



reticle

Reticle, reticule the measuring scale, aiming indicator or marks placed in the focus of an optical instrument: used in sighting telescopes, periscopes and other fire control instruments to determine the point-of-aim, size, distance, direction or position of objects sighted upon. The scale or marks are usually etched on glass and referred to as the reticle. In some rifle scopes, the cross-wire reticle is made by stretching two hairs or fine wires across a ring-like disk. "Graticule" is the British word for reticle.

Retractor better known as the slide in a semi-automatic pistol, a metal sleeve covering part or all of the barrel and the action, or merely the top of the action, usually forming the breechblock. It goes backward by recoil and is restored to its normal position by the recoil spring.

Retreat gun in the military service, the firing of a gun as a signal for the lowering of the national emblem at retreat. It is fired after the sounding of the last note of the bugle call at retreat. Also called "evening gun."

Return to go back into the former position, as in the case of the mechanism of an automatic or semi-automatic gun.

Return pistol a military command to restore the pistol to its holster.

Reveille gun in the military service, a gun fired at the first note of reveille or at sunrise. Also called "morning gun."

revolver

Revolver a repeating handgun having a rotatable cylinder containing a series of firing chambers. The action of the trigger and firing mechanism rotates the cylinder in stages so that each chamber is sequentially aligned with the bore, thereby presenting its cartridge to the action of the firing pin. The revolver, first patented by Samuel Colt in 1835, has remained a standard design in the United States.

Revolver action an action that can revolve a number of chambers or barrels to present, in succession, their contained rounds to the firing mechanism. The handgun known as the revolver derives its name from its revolving cylinder. Less known is the fact that some rifles in the past employed revolving cylinders. Use of revolving barrels in a handgun is typified by the "pepperbox" and in other weapons by the Gatling gun.

RF in referring to ammunition, it is the abbreviation for "rimfire cartridge."

Rib a metal rail soldered to the top surface of a single barrel shotgun, or between the barrels of a side-by-side double barrel shotgun. Extending from the receiver to the muzzle, the rib is designed to facilitate aiming by providing a straight, level, sighting plane. Generally found on deluxe grade shotguns — particularly target models — ribs also occasionally used on rifles and handguns.

Rib rifling the rifling of the bore of a gun in which the lands and grooves are of equal width.

Richards, William Westley (1788–1865) an English gunsmith who, in 1821, received a patent on a so called "detonating gun" popluar in its time. It was a percussion gun that could be primed with powdered fulminate, paper caps or pellets. Westley Richards (1814–1897), his eldest son, also attained fame as a designer and manufacturer of firearms.

Ricochet (RIK oh SHAY) the skipping motion of a projectile that may result when it strikes a flat surface. Loosely used to describe a projectile that re-

bounds from an object. It is a phenomena of low velocity rather than of high velocity.

Rifle a shoulder arm having a long barrel whose bore has a number of shallow grooves cut into its surface longitudinally, leaving raised surfaces called lands between them. Originally, some rifles had straight lands and grooves, now they follow a helical curve to impart a spinning motion to a bullet that passes through. Its long barrel distinguishes it from the carbine.

Rifled slug a conical soft lead bullet having a rifled surface and a hollow base, used in shotguns for big game hunting. (An example is the Brenneke slug.) Contrary to popular belief, rifled slugs do not attain a bullet-like spin in flight but rotate slowly, making about one revolution in thirty feet. This slight rotational motion, together with the balance created by weighted nose section, results in reasonable accuracy at distances up to 100 yards.

Rifle grenade a grenade or small bomb designed to be fired from a rifle by using a special device called a launcher attached to the muzzle of the gun. An early grenade launcher was made about 1760 at the Tower of London Armory to fire a spherical grenade. It was a flintlock weapon with a 14 inch long barrel, 3 inches in diameter.

Rifleman generally applied to a soldier armed with a rifle but also is applicable to a target shooter or hunter using a rifle.

Rifle musket a military muzzleloading, percussion shoulder arm having a long barrel, large caliber and other musket features but a rifled bore instead of a smooth bore.

Rifle pit a hole in the ground from which a shooter is able to fire a weapon. Usually offering some protection as well as concealment, these holes were called "fox holes" by American troops during World War II. Japanese soldiers often went to great lengths to conceal their pits, even rigging them with camouflaged coverings, and U.S. marines referred to these as "spider holes."

Rifle range a range adapted for practice in rifle firing.

Riflery the sport of target shooting with a rifle.

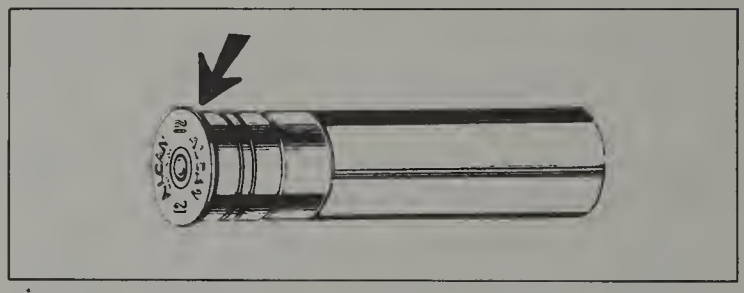
Rifle salute as defined in the U.S. Army manual of arms, is the salute in which the rifle is held at right shoulder arms or order arms position, and the left hand is carried smartly across the body to the rifle, forearm horizontal, palm down, fingers together and extended.

Rifle scabbard a sheath or holster for holding a rifle or carbine.

Riflescope another term for telescopic sight. See "telescopic sight."

Rifling the helix formed in the bore of a barrel to give a spinning motion to a projectile passing through it.

Rigby refers to John Rigby & Company of London, England, prominent manufacturer of fine quality sporting rifles and shotguns.



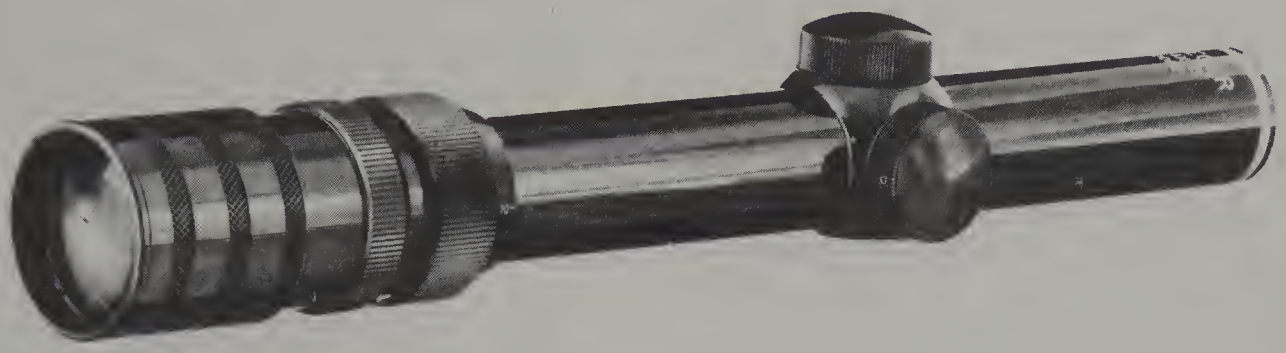
rim

Rim that part of the base of certain cartridges that extends beyond the body of the cartridge case.

Rimbase the shoulder of a rifle stock on which the breech rests.

Rimfire a cartridge having the priming mixture

riflescope (rimfire)



riflescope

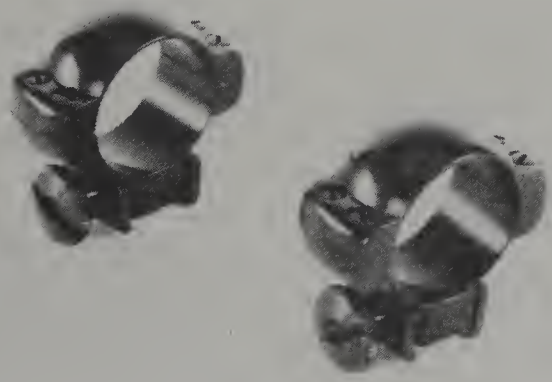
lodged inside the rim of the case is termed a rimfire cartridge. The firing pin is positioned in rimfire firearms so it strikes the rim, thus igniting the propellent charge in the cartridge case. Abbreviated as RF.

Rimless a cartridge whose base is the same diameter as the body of the case is so designated. All such cartridges are center-fire.

Rimmed a cartridge whose base is of greater diameter than the body of the case is so designated. The rim prevents the cartridge from entering the chamber too deeply. Such cartridges may be either center-fire or rim-fire.

Ring and bead sight the sighting system of a gun that uses a ring for the rear sight and a bead or post for the front sight.

Ring bulge a bulge in the barrel of a gun resulting from an obstruction in the bore of a gun at the time it is fired.



rings

Rings those portions of a scope mount that are used to encircle a rifle telescope. The bottom surface of each ring is made with a locking device so that it can be securely fastened to the mount base.

Ring sight a ring through which a shooter looks to sight on a target. Generally used as a rear sight.

Ring trigger an oddity found in some old weapons having revolving cylinders in which cartridges were chambered. It was a trigger separate and apart from the firing trigger and generally used only to revolve the cylinder to place a new cartridge in position for firing. In 1861 and 1862, a few 6-shot pistols in .22 caliber were made with a ring trigger that also was used for firing.

Ring trigger revolver a type of revolver in the percussion period that used a ring trigger to revolve the cylinder and usually had a separate trigger for firing as described above.

Riot gun any short barreled shotgun, usually one with a 20-inch cylinder bored barrel, used in guard duty or to scatter rioters.

Rivet a headed metal pin or bolt used for joining two or more pieces by passing the shank through a hole in each piece and then hammering the plain end to form an opposing head. Commonly used to fasten the metal accessories to a leather sling strap, or fittings to holsters, gun cases, etc.

Rocket a self-propelled device that derives its propelling force from gases escaping from jets or nozzles at the rear of a combustion chamber. For use in a small arm, see "Gyrojet."

Rock Island Arsenal a U.S. Army manufacturing arsenal located at Rock Island, Illinois, had its origin in Civil War days in 1863. During World War II, it produced small arms, field artillery, carriages and recoil mechanisms of all types. It has taken over the responsibilities for small arms formerly assigned to Springfield Arsenal.

Rock maple also known as "sugar maple" or "hard maple," this is a seldomly used gunstocker's wood that is grown widely in the Northeastern U.S. Harder than walnut and considerably more difficult to work with, rock maple is very light in color and does not easily accept staining. Rock maple, having attractive "birds-eye" figuring, was widely used by American gunsmiths during the muzzleloading period.

Rockwell hardness test a hardness test conducted with a Rockwell hardness tester, which employs an initial load, then a final major load to a steel ball or a diamond sphereoconical penetrator to the surface of the metal being tested. The depth of penetration measures the relative hardness as determined by the appropriate Rockwell scale.

Rod, cleaning See "cleaning rod."

Rod ejector a rod used manually to eject a cartridge case from the chamber of a handgun.

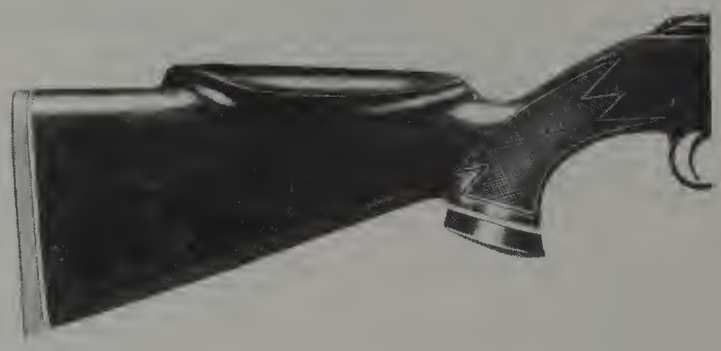
Rolled crimp 1. an all but discontinued method for closing the mouth of a shotgun shell. In roll-crimping, a cardboard wad is laid over the top of the shot column, and the end of the shotshell tube is folded inwardly, so that its leading edge will bear against the "over-shot wad," thereby locking it in place. 2. a crimp formed in the mouth of a cartridge case by turning the edge inward to seat in a groove encircling the bullet near its base. It serves to firmly hold the bullet in place and adds to the waterproofing quality of the cartridge.

roll engraving

Roll engraving an inexpensive form of metal decoration which simulates engraving but which is applied by simple roll stamping.

Rolling block pistol a pistol introduced in the 19th century, which permitted the breech block to be pivoted backward exposing the chamber, when the hammer was at full cock. After inserting a cartridge, the breech block was pivoted forward to its closed and locked position.

Rolling block rifle an early breech loading rifle mechanism credited to Joseph Rider and Leonard Geiger. Perfected late in 1865, and manufactured by Remington Arms Co., the rolling block rifle was exceptionally strong and it attained world-wide popularity as a military weapon. The name "rolling block" stems from the design itself: a hinged block located immediately behind the breech swings back and down to facilitate loading or unloading. When closed, it effectively seals the breech for firing. A firing pin is located within the block and an exposed hammer, mounted just behind the block, provides the energy needed to propel the firing pin into the primer.



roll over cheekpiece

Roll over cheekpiece a form of cheek rest that clearly overlaps the comb of the stock and protrudes slightly on the off side.

Rook cartridge a low powered cartridge developed in England for shooting pest birds and animals.

Root, Elisha King (1808–1865) an American manufacturer whose inventive genius applied to machines for making firearms proved of great value to Samuel Colt, with whom he worked beginning in 1849.

Rosewood a form of hardwood yielded by the rosewood tree of Brazil, Honduras and Mexico. A very colorful wood, rosewood ranges from pale red to purple with dark brown-black streaking. It is often used in making decorative forend tips and pistol grip caps for gunstocks, but is too heavy for overall stock work. Very hard and close-grained.

Ross a .303 caliber, 5 shot rifle formerly produced in Canada, characterized by having a straight-pull action developed in the 1890's by Sir Charles Augustus Frederick Lockhart Ross. Manufacture was discontinued in 1917.

Rotary breechblock an early type of breechblock that opened or closed the breech as it was revolved.

Rotary magazine designed by Ferdinand Ritter von Mannlicher of the famous Steyr Works in Austria, and considered the finest of all sporting rifle magazines, because it perfectly aligns each cartridge with the chamber and eliminates the possibility of bullet deformation. Some claim has been made that Schulhof's spool magazine was a successful forerunner of Mannlicher's 1887 rotary magazine. Rotary magazines, as used in the Mannlicher-Schoenauer rifle and Savage Model 99 rifle, are entirely contained within the receiver mechanism. They have a capacity for about five cartridges. A spring powered rotary fol-

lower feeds each cartridge for loading as the preceding case is ejected. The new Steyr-Mannlicher rifle, recently introduced, employs a rotary follower contained in a detachable box magazine. Similar devices are also made by Savage Arms Corporation and Sturm, Ruger & Co.

Rotate a turn around or spin, such as the rifling does to a projectile as it passes through the bore of a gun. See "spin."

Rotating band a band of soft metal around a projectile near its base of slightly greater diameter than the diameter of the bore, taken on the face of the lands, adapted to engage the rifling, and thus cause the projectile to rotate, i.e., spin, and seal off the gases of the explosion.

Rotation the motion of turning or spinning imparted to a projectile as it passes through the rifled bore of a gun, thus imparting greater accuracy to it. Depending upon the muzzle velocity of the bullet and the twist rate of the barrel, a thirty-o-six bullet may attain a speed of 213,840 revolutions per minute; a .22 rifle bullet, a speed of 50,400 revolutions per minute.

Rottenstone a friable silaceous stone used for polishing and grinding various surfaces. Finely ground rottenstone, moistened with olive oil or water, is used by many gunsmiths to rub on gunstocks after an oil surface has been built up, in preparation for a finishing wax.

Round all of the components required to make up the ammunition needed to fire one shot. Thus, in a fixed round of ammunition, the components, assembled into a single unit called a cartridge, are the bullet, propelling charge, primer and case.

Round ball a lead ball used as a single ball shotgun load.

Round ball bullet a bullet spherical in shape.

Round, fixed a completely assembled round of ammunition, all components being in a single unit that can be placed in the gun with one motion.

Round nose bullet a bullet whose shape is characterized by its round nose.

Rubber natural or synthetic, finds use in firearms products principally as the material from which recoil pads are made.

Ruger a trademark of the firearms manufacturing firm, Sturm Ruger Company, of Southport, Connecticut.

Run the passing of a moving target once across the range.

Runaway gun an automatic or semiautomatic gun that continues to fire after the trigger is released. A defect in the mechanism causes this condition.

Run-overs a flaw common to hand checkering; it describes a condition where certain lines are seen to extend beyond the border.

Rupture a circular break in the wall of a fired cartridge case, causing loss of power and difficult extraction or jamming.

Russian roulette the extremely dangerous game of chance in which a single chamber of the cylinder of a revolver is loaded, the cylinder is spun, the revolver pointed at the head of the player and the trigger squeezed. In theory, the cartridge by unbalancing the cylinder will cause the cylinder to stop with empty chambers at the top. Factors that negate this possibility are, lack of delicate balance of the cylinder and impediments in the free spinning of the cylinder, such as dirt, rust, etc.

Rust the result of oxidation of the surface of a metal. In the case of iron, the rust that may form is iron oxide, a chemical combination of iron and oxygen.

Rusting process a slow, tedious process for cold-blueing steel. After polishing and degreasing, an acid rusting agent is liberally applied to the metal and permitted to dry. This causes a light coating of rust which is brushed off with a soft wire wheel. The parts are then dipped in boiling water and the entire process repeated. Several applications are usually necessary over a period of three or four days before a satisfactory blue finish can be obtained. Double barrel guns having soft soldered ribs *must* be blued by this process.

Rust inhibitor a chemical compound that will cling to the surface to be protected and shield it from rust producing conditions. Various greases are used for this purpose with firearms, particularly for periods of storage.

Rust removal from steel or iron surfaces of firearms, is accomplished chemically or by the use of the finest grade of steel wool.

Rust resistance in iron and steel is continually being researched to improve that quality in iron and steel. Alloying steel with nickel or copper gives it increased resistance to corrosion. Steel with the proper chromium content is called stainless steel. Protective coatings are employed to prevent rusts, permanently, such as with copper; for limited periods by painting; and removable such as by greasing.

RWS initials standing for Rheinische-Westfalische Sprengstoff A.G., a German munitions manufacturing facility founded in 1856 by Heinrich Utendoerffer in the city of Nuremberg. Though the original name was discarded as a result of corporate reorganizations, the initials RWS remain today in the present corporation title, "RWS Dynamit Nobel Aktiengesellschaft." Famous for the development of non-mercuric, noncorrosive primers marketed under the trade name Sinoxid. Also known for their fine D-Mantle and H-Mantle hunting bullets. RWS primers, bullets and sporting ammunition are distributed in the U.S..

S

SA abbreviation for single action.

S&W abbreviation for Smith & Wesson and also one of its registered trademarks.

Sabot (SAB O) a word derived from the French, a kind of shoe. It is the name given to a separate base or cup used on certain projectiles. Formerly also so used on projectiles shot from muzzleloaders.

Saddle ring another name for a sling ring. See "sling ring."

SAE abbreviation for Society of Automotive Engineers.

Safety a safety device on a firearm that prevents it from being fired accidentally. It may be part of the grip and automatically set, or a thumb piece may control it. See "safety catch," "safety lever," "safety lock," "grip safety," "push button safety."

Safety catch generally refers to the accessible external piece that may be manually moved by a shooter to place a safety device in "on" or "off" position.

Safety lever a lever that sets the safety mechanism on certain types of automatic weapons.

Safety limit 1. the lines that mark off the target area within which danger exists not only from direct fire but from ricocheting and rebounding projectiles and fragments. 2. the point at which maximum recommended breech pressure is met by a given powder charge.

Safe working pressure the pressure that may be safely used in a gun.

Sako (SOCK o) a well known brand name for firearms made by the firm of Oy Sako Ab of Riihimaki, Finland. Particularly well known in the U.S. for their line of bolt action sporting rifles.

Sal ammoniac the common name for the chemical ammonium chloride, a soluable, white solid, used in one of the earliest known methods for browning the metal surfaces of firearms, widely practiced by early American gunsmiths.

Saltpeter, saltpetre the popular name given to potassium nitrate and to sodium nitrate.

Saluting gun a cannon used for firing salutes.

Salvo the discharge simultaneously or in regular succession of a number of small arms or of artillery pieces.

Sarasqueta a trademark of the firearms manufacturing firm of Victor Sarasqueta, S.A., Eibar, Spain.

Saturday night special a term conjured up by the press and anti-gun proponents to create the illusion that the U.S. market is flooded with cheaply made, often faulty, mass-produced handguns which readily fall into the hands of the underworld. There is no valid basis for the theory or the claim.

Sauer a well known German manufacturer of firearms, particularly noted for fine automatic pistols and shotguns. Until the Russians took over the occupation of East Germany, Sauer was located in Suhl. Upon fleeing to West Germany at the close of WW II, Sauer's management established a new plant in the city of Eckernforde.

Savage a trademark of Savage Arms Company, firearms manufacturers, located in Westfield, Massachusetts.

Savage, Arthur W. (1857–1938) a firearms designer and inventor who, in 1893, patented a lever action rifle having a rotary magazine and means for directly locking the breechblock to the receiver. Production began in 1895, and in 1899 an improved version was produced, known as the Model of 1899, or more popularly called the Savage 99.

Sawed off shotgun a shotgun whose barrel or barrels have been reduced in length, thus widening the shot pattern at close ranges and making the weapon more concealable on the person. The National Firearms Act specifically includes within the scope of its application, shotguns with barrels less than 18 inches in length.

S-bore refers to the barrels of German military rifles that will safely fire the 8 × 57 JS Cartridge which has a pointed, flat base, 154 grain Spitzer bullet measuring .323" in diameter. The letter "S" was added to the designation 8 × 57J, upon adoption of this cartridge by the German Army (circa 1905), to distinguish it from the older, 8 × 57J cartridge, which was loaded with a smaller (.318 dia.) round nose, 226 grain bullet. It should be noted that the letter "J" in the designations 8 × 57J or 8 × 57JS is actually a misnomer resulting from misinterpretation of the gothic letter "I" which the Germans used as an abbreviation for "Infanterie." Both cartridges were made with similar cases measuring 57mm's in length, but differences in powder and bullet components were considerable. Nevertheless, these shells shared a number of common designations, such as "8mm," "8mm Mauser," "7.9mm," "7.92," "7.9 × 57mm," "8 × 57mm." The original 8 × 57J cartridge was created for the Model 1888 German Army rifle. Upon its introduction, the Model 1898 Mauser military rifle was also chambered for this shell. Later, when the

8×57JS shell was adopted, Mauser 1898 rifles were redesigned to accommodate it. While it is possible to use the "J" (.318″) shell in rifles bored for the "S" (.323″) round (though with some loss of accuracy), the "S" (.323″) cartridge cannot safely be used in rifles bored for the "J" (.318″) shell. Further confusion resulted when German sporting arms manufacturers modified both the "J" and "S" cartridges for sporting application by adding rims to the casings. Rimmed cartridges were then distinguished from the military rounds by the introduction of the letter "R" to their designations, such as "8×57JR" and "8×57JRS." At times, too, various manufacturers have simply dropped the letter "J" when referring to S-bore rifles or cartridges. American manufacturers of sporting ammunition load a reduced power cartridge with a 170 grain .320″ diameter bullet under the designation 8mm Mauser, to reduce the danger if inadvertently used in a .318″ bore rifle. For safety reasons, all 8mm rifles and cartridges of unknown dimensions should be checked by a competent gunsmith before use.

Scabbard a term for "sheath," once relating only to carrying cases for swords, knives, etc. In the field of firearms, the term "scabbard" has come to mean a full length carrying case for a long gun (carbine, rifle or shotgun), frequently open ended, used for transporting long guns by horseback or motor vehicle. Most often made of leather, a scabbard permits handy access to a weapon, while simultaneously providing it with a measure of protection from weather, bumps, dirt, etc.

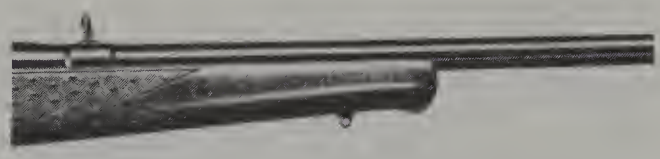
Scatter gun any form of shotgun, however, more appropriately used in referring to a "sawed-off" shotgun — a shotgun with a shortened barrel designed to provide the widest possible dispersion of the shot charge. In muzzleloading days, the term was "fowling piece."

Scatter shotshells a shotgun load of shot compartmentalized in the shell so that when fired, a more open pattern will be obtained. Also known as "brush," "scatter," "close-range," etc., loads.

Scent-bottle lock the name given by collectors to a magazine with which the first Forsyth detonators were fitted. Holding about 40 primings, it could be turned to prime the gun after each shot. In subsequent improvement, a sliding magazine was used.

Schmeisser a 9mm German machine pistol designed by Hugo S. Schmeiser, made in several models starting in 1917. Used in World War II by Japan, Germany and various European countries as a limited standard weapon.

Schnabel a German term for a particular forearm design characterized by an enlarged knob at its leading edge. Most often found on sporting rifles.



schnabel

Schneider, F. E. of Paris, who was granted an English patent in 1861 for the first widely used center fire cartridge case.

Schoenauer, Otto (SHOWN auer) an Austrian gunmaker and inventor, who was Director of the Austrian Arms Factory at Steyr, Austria, and in 1900 collaborated with Ferdinand Ritter Von Mannlicher to develop a spool type rotary magazine for the Mannlicher bolt action rifle. A sporting carbine followed and was called the Mannlicher-Schoenauer.

Schuetzen buttplate a deeply curved metal buttplate with a long extension from the toe area of the stock. First used on German single shot target rifles, the Schuetzen buttplate has attained considerable popularity throughout the world. It is used when shooting from the offhand (standing) position and serves to steady the rifle. Often referred to as a "hook" buttplate.

Schuetzen rifle a German type of single shot target rifle designed specifically for offhand target shooting. Most commonly made for caliber 8.15 × 46MM with a falling block action, octagonal barrel measuring approximately 28 to 30 inches, double-set target triggers, ramp front sight with fine blade, high aperture type tang sight, and a steeply dropped buttstock with hook buttplate. Weight is generally between nine and twelve pounds.

Schwartz, Berthold (circa 1310–1384) a legendary German monk, erroneously credited in the past as being the inventor of gunpowder. He was concerned with the casting of cannon and in that connection experimented with gunpowder.

Sclerometer an instrument used in laboratory work for measuring the hardness of materials. Essentially it consists in scratching a line on the surface of the material tested with a diamond point, under a known pressure. The width of the line is then read and converted to an arbitrary scale of hardness.

Scleroscope (SKLER uh SCOPE) the trademark for an instrument for measuring the hardness of a material which basically employs a diamond tipped hammer that is dropped from a fixed height upon the surface of the metal to be tested. The higher the hammer rebounds, the harder the metal. By taking read-

ing of the height of rebound, relative hardness may be ascertained.

Scope a shortened form of the word "telescope," meaning a telescopic sighting device for a firearm or, simply — "riflescope." While a telescope magnifies an image, a riflescope is made with an integral fire-direction indicator called a "reticle" which, most often, appears as crossed-hairs or crossed-wires. A riflescope is securely mounted on a firearm and adjusted so that its vertical cross wire is aligned with the path of the fired projectile. The horizontal cross wire is then set to coincide with the projectile's point of impact at a specific distance.

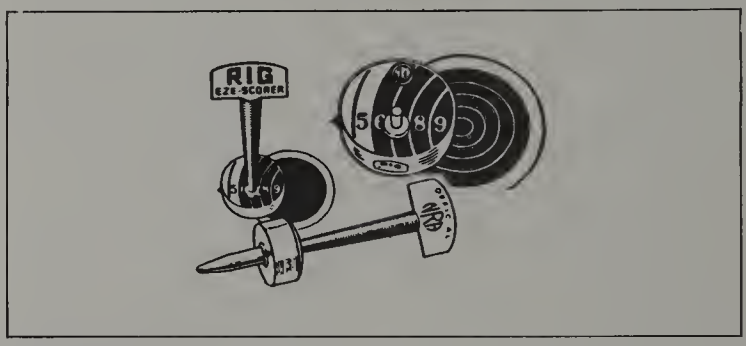
Scope height refers to the distance between the axis of the bore and the axis of the scope on a given firearm. The size of a scope and mount necessitates that the axis lines of scope and bore be somewhat farther apart than would be the comparable lines if iron sights were substituted for the scope. For this reason the comb of the rifle stock is generally made higher to facilitate positioning of the shooter's eye behind the scope. Once a rifle is properly stocked for scope shooting, ordinary iron sights cannot be employed — special scope height iron sights must be fitted.

scope mount

Scope mount a steel or dural device used for attaching a scope to a firearm. The scope mount is generally made with a one or two-piece base plate that is fitted to the firearm with machine screws. To the base plate is then fitted a one or two piece scope-encircling ring assembly. All components must be securely locked together, looseness in any one member will preclude accuracy.

Score 1. in paper target match competition, a shooter's score is determined by the total value of all the required shots fired in a given match. 2. in skeet or trap competition, the score is the number of clay birds broken by a competitor in a given course of fire. 3. it may mean a scratch or line in a surface such as might occur on the outside of a cartridge case.

Scoring the act of scoring targets; it is the process of determining the value of each shot and/or of tabulating total scores in accordance with the scoring procedures established for each form of target shooting.



scoring plug

Scoring plug a target scoring plug is designed to trace the path of a bullet through a paper target and to aid in determining the exact location and value of shots in a target. Plugs are made in various sizes to coincide with specific rifle and pistol calibers; they are shaped like bullets and are made with sharply defined collars that are matched precisely with specific bullet diameters. When a particular bullet hole is in questionable proximity to a scoring ring, the plug is

scroll engraving

placed in the bullet hole and the location of the collar examined. To aid in this examination some plugs are made with magnifying optical sleeves.

Screw-barrel pistol a pistol, apparently of English origin, that first appeared about 1642, made with a barrel shaped like a miniature cannon, generally smoothbored though occasionally rifled. The breech portion, into which the barrel was screwed, contained a chamberlike cavity that received the powder charge and ball. To use this weapon, the shooter had to remove the barrel to load and reinstall it to fire.

Screw pitch gage a tool designed to measure the size and pitch of screw threads.

Screw thread the projecting helical rib on a screw.

Scriber a sharply pointed tool made from hardened steel and used to scribe lines on steels or other metals.

Scroll engraving decorative patterns lightly cut into metal surfaces by means of a hand chisel and hammer.

Sear the lock or catch in a gun that holds the firing pin or hammer back until released by the trigger mechanism.

Sear spring a small spring that acts upon the sear to position it in operable relation to the trigger and hammer.

Season cracking a fine crack generally the length of the neck of a brass cartridge case appearing years after manufacture. Modern manufacture has all but eliminated this defect.

Seat 1. to fit correctly in a prepared position, such as placing a cartridge in the chamber of a gun. 2. in ammunition loading: to position a bullet properly in the neck of a cartridge case, or, to position a primer in the primer pocket of a cartridge case.

Sectional density is the mass of the bullet in proportion to its cross section. It is found by dividing the weight of the bullet in pounds by the square of its diameter in inches.

Seize to grasp suddenly as in the case of overheating of the parts of an automatic gun, causing them to expand and become immobilized.

Selective assembly the method of assembling parts into a finished product by the trial mating of the parts to find the desired fit with a minimum of further machining or fitting. Sometimes this method is employed even with interchangeable manufacture. See "interchangeable manufacture."

Selective single trigger See "trigger, selective single."

Selective trigger See "trigger, selective single."

Self loading a firearm that has a mechanism that automatically extracts and ejects a fired case and loads another cartridge into the chamber in a firing attitude. Also called semiautomatic or autoloading.

Self lubricating a mechanism that by its own movements introduces and spreads the required amount of lubricant over its contacting surfaces.

Semiautomatic partly self acting, thus in a gun, one that is self loading but not self firing, requiring a separate squeeze of the trigger for each shot.

Semiautomatic actions used in semiautomatic firearms may be recoil or gas operated, as described under "recoil actions" and "gas operated."

Semiautomatic fire fire delivered from a self loading weapon with a separate pressure on the trigger for each shot. See "automatic fire."

Semi bar lock a form of side lock illustrated in the Appendix.

Semifixed ammunition ammunition in which the cartridge case is not secured to the projectile.

Semifixed box magazine a magazine that can be loaded while fixed in the firearm but which may be removed for cleaning purposes. Such a magazine is found in certain military semiautomatic rifles, such as the Belgian Fabrique Nationale Model 1949.

Semi-inletted stock a gun stock that is 75 to 80% inletted and shaped.

Semi-pointed a term applied to a bullet shape that is characterized by a sharply tapered pointed nose.

Semi-rimmed a cartridge having a rim that extends slightly beyond the diameter of the case and a shallow extractor groove just forward of the rim.

Seneca match a competition designed to test the speed, endurance, loading abilities and accuracy of a muzzleloading contestant. Competitors race over a prescribed course, shooting at targets set over random distances and winners are determined by a combination of time and target scores.

Separate loading ammunition ammunition not assembled as a single unit to fire one shot. For example, in large caliber cannons, the projectile, propelling charge and primer are not assembled into a case but are loaded separately in the gun.

Serial number the number stamped on an article to identify it. By such identification the manufacturer of a gun and its user may communicate with respect to performance, parts, etc. Federal firearms laws require that a serial number be on each firearm manufactured in or imported into the United States and prohibit the distortion or obliteration of firearms serial numbers. Furthermore, they make unlawful for any person knowingly to transport, ship, or receive in interstate or foreign commerce, any firearm from which such serial number has been removed, obliterated or altered.

Serpentine 1. an "S" shaped piece of iron used as a holder for the slow match of a Matchlock. It was the equivalent of the later-day hammer. The jaws of its upper end held the match and its lower end served as

the trigger, the piece being centrally pivoted. 2. the name applied to a type of cannon used in the 15th to 17th centuries.

Serpentine powder saltpeter, charcoal and sulphur ground dry to a flour-like composition, used as gunpowder until the middle of the 15th century, when it was supplanted by corned powder. Sometimes just called "serpentine." See "corned powder."

Serve to operate a gun or keep it in action by supplying ammunition to it. Thus the expression "to serve the piece" means to perform the function required to fire a gun or make it ready for firing.

Service the operation of a gun or supplying it with ammunition.

Service ammunition ammunition intended for combat, rather than for training purposes, is the definition approved by the United States Joint Services and appearing in the Dictionary of United States Army Terms.

Service marking symbols, numerals or letters that are placed on military items of issue to give information needed for proper handling, storge or use.

Service match a target shooting competition held in accordance with military practices or a match restricted to military competitors.

Service of the piece operation and maintenance of a gun.

Service pistol the .45 caliber model 1911 or 1911A1 automatic pistol as issued to the military. Under National Rifle Association service match rules, the specifications for handguns used in these matches are strictly regulated.

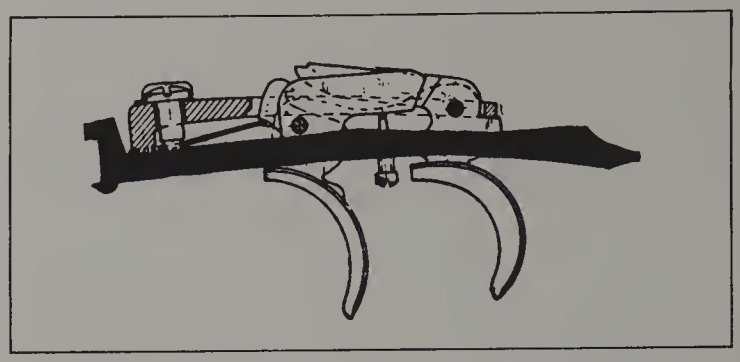
Service test the test given to a military item in the field after it has passed through the engineering, experimental and development stages and before it is classed as standard.

Setback the rearward jerk, caused by inertia, of free moving parts in a projectile when it is fired. The force is used to push back a spring or plunger in a time fuze to start its operation.

Set-screw a screw positioned so it may be brought to bear on another screw in a firearm and thus prevent it from loosening. The screw that adjusts the pressure required to release a trigger is also called a set-screw.

Setting 1. the adjustment of a device to predetermined position such as the scale of an aiming device of a gun. 2. cocking the trigger mechanism in a set-trigger firearm. See "set trigger."

Set trigger a trigger mechanism that may be adjusted for a very light pull — may be a single set trigger or double set trigger. In either case the trigger is made with a spring powered trigger lever. The term "set" stems from the fact that the trigger must be set (cocked) by pushing it forward. Upon setting, the single trigger is pulled in the conventional manner resulting in a weight of pull that is extremely light, and usually adjustable from a fraction of an ounce to eight ounces. The set trigger can also be used without setting but weight of pull is considerably heavier. Double set triggers are two triggers mounted one behind the other. The rear trigger is generally the setting trigger and is pulled rearward to cock the spring powered lever. Subsequent pressure on the forward trigger will then fire the gun. Some trigger manufacturers reverse this procedure by making the forward trigger the setting trigger, in which case it is pushed forward instead of rearward. Like the single set trigger, most double trigger mechanisms will permit firing by pressure on the firing trigger (without setting) but the resultant weight of pull is, again, considerably heavier.



set trigger

Shaped charge a high explosive in a projectile characterized by its hollowed out front, which produces its ability to penetrate armor plate with a long thin jet of extremely hot gases of great intensity.

Sharps famous breech loading percussion rifles and carbines using the invention of Christian Sharps, patented in 1848. Made for both military and civilian use. It embodied a sliding vertical breech block opened and closed by a lever under the gun, which also served as a trigger guard.

Sharps buffalo gun a gun of the gold rush days made in calibers of from .40 to .50.

Sharps, Christian (1811–1874) an American gunsmith who, in 1848, patented his basic breech loading mechanism introducing the principle of the drop block action. Arms of his design were made by many different manufacturers but in 1863–1867, he produced the famous Sharps and Hankins carbines and rifles. When adapted to metallic cartridges, they became famous as the guns of the buffalo hunters.

Sharpshooter a marksmanship classification for skill in the use of small arms. It ranks above "Marksman" and below "Expert."

Sharps rifle an American percussion lock breech loading weapon patented in 1848 by Christian Sharps, noted for having introduced the principle

used in the "drop block" breech loading actions. First used with paper cartridges, later metallic cartridges. Both rifle and carbine used during and subsequent to Civil War. Many variations were produced. The buffalo gun of the early West was known as the Sharps buffalo gun. A carbine was also made.

Shattuck "Unique" pistol an oddity made with four .22 caliber 1 3/8 inch barrels bored in a blank that tips down to unload. Instead of a trigger, a movable portion of the frame, if squeezed, will revolve the firing pin and fire each barrel in rotation. It is a true palm pistol.

Shaw, Joshua (1777–1860) an English born American inventor who, while working in Philadelphia, Pennsylvania, in 1814, became known for having developed the copper cap to hold fulminate. He may have been the first to do so.

Sheaf of fire See "cone of dispersion."

Sheath trigger an old trigger type having no trigger guard but having the trigger extending only slightly from the frame just ahead of the grip.

Shell a shotgun cartridge. In military usage it means a hollow projectile adapted to be filled with an explosive or other filler. Any empty cartridge case is sometimes loosely referred to as a "shell."

shell holders

Shellac a resin, soluble in alcohol, used in the making of spirit varnishes and as an electrical insulator and in various compositions of matter as a binder. Gunsmiths do not consider it equivalent to varnish as a gunstock finishing agent. For a quick finish, they suggest lacquer. A pad of lint free cloth wrapped about a tuft of alcohol soaked cotton can be dipped alternately into boiled linseed oil and shellac to achieve (through handrubbing) a glossy gunstock finish known as French polish.

Shell extractor See "extractor."

Shell fire a bombardment by artillery projectiles, especially those exploding on impact or upon the lapse of a set time.

Shell holder a device designed to hold a cartridge as employed in the reloading of fired cases.

Shell proof immune to damage from shells or bombs, such as a shell proof shelter.

Shell shock a broad term covering mental and nervous disorders brought on by the cumulative emotional and psychological strains of warfare, formerly believed to have been brought about only by the exposure to exploding shells in battle.

Shell wave See "ballistic wave."

Shield See "recoil shield."

Shim a thin sheet usually of brass, steel or some other metal placed between parts to make compensating adjustments for wear, weight, or for other reasons.

Shocking power the ability to move a target or other body. Also referred to as knockdown effect. See "knockdown effect."

Shoot to discharge a gun.

Shooter one who discharges a firearm. One who discharges a cannon is more appropriately called a gunner.

Shooting box 1. a box used by shooters to carry ammunition and accessories. 2. a box shaped shooting stand — usually camouflaged and more properly known as a "blind box."

Shooting eye refers to the dominant eye, the one used by a shooter to align his sights. The dominant eye may be identified by holding a finger at arm's length and with both eyes open lining it up with a distant object. If the finger remains stationary when one eye is closed, it is the open eye that is dominant and should be used to sight a firearm.

Shooting gallery See "gallery range."

Shooting glasses protective eye glasses (not unlike sunglasses in appearance) colored to minimize glare and made from tempered, shatterproof glass. The use of such protective glasses while shooting is strongly recommended by the firearms industry, particularly when reloaded cartridges are employed.

Shooting iron a slang expression for a firearm, usually a handgun.

Shooting lodge a lodge used as a base of operations by sportsmen, generally during the hunting season.

Shooting positions the various positions that may be assumed by a shooter in aiming at at target. See "fire position," "back position," "kneeling position," "offhand position," "prone position," and "squatting position."

Shootoff a tie-breaking system, frequently employed in skeet and trap shooting, in which the tied competitors fire at additional targets (usually 25) until one shooter emerges as the winner.

Shoot out a slang expression for a gunfight.

Shore scleroscope a device for testing the hardness of metal. A diamond tipped hammer is allowed to drop from a known height upon the metal being tested, and the extent of rebound is used to calculate the measure of hardness. The higher the rebound, the harder the metal.

Short a shot that fails to reach the target. One that goes beyond the target is an "over."

Short arm a term commonly applied to a handgun.

Short-barreled rifle as defined in the Gun Control Act of 1968 — "The term 'short-barreled rifle' means a rifle having one or more barrels less than sixteen inches in length and any weapon made from a rifle (whether by alteration, modification, or otherwise) if such weapon, as modified, has an overall length of less than twenty-six inches." (Section 921, (a) (8), Chapter 44, Title 18, United States Code, as amended October 22, 1968.)

Short-barreled shotgun as defined in the Gun Control Act of 1968 — "The term 'short-barreled shotgun' means a shotgun having one or more barrels less than eighteen inches in length and any weapon made from a shotgun (whether by alteration, modification, or otherwise) if such weapon as modified has an overall length of less than twenty-six inches." (Section 921 (a) (6), Chapter 44, Title 18, United States Code, as amended October 22, 1968.)

Short range 1. a range of limited distance for firing. 2. ammunition having a range of relatively short distance.

Short recoil action a locked breech system using the recoil of bolt and slidable barrel to eject a fired case and to reload a semiautomatic pistol, rifle or shotgun. The breech bolt and barrel while locked together, and until the bullet leaves the barrel, move rearward a short distance which, depending upon the design of the gun, may be from ⅛" to ¾". Unlocked after the bullet leaves, the bolt continues rearward under its own momentum, helped by residual gas pressure, to eject the fired case and be stopped by a buffer. A counter recoil spring, compressed during the rearward movement, then reacts by forcing the bolt to its original position and causes it to pick up and chamber another cartridge in preparation for the next firing.

Short round a defective cartridge having its bullet seated too deeply.

Shot 1. the single firing of a gun. 2. spheres of lead or lead alloy used as projectiles in smooth bore weapons. Also solid balls used in cannon or cannisters. See Appendix.

Shot ballistics a term sometimes applied to the study of the flight of shot pellets.

Shot bridging the term applied to a condition of stoppage that sometimes occurs in the drop tube of a shotshell reloader when the shot wedges together in the tube.

Shot cartridge a metallic cartridge case loaded with small shot. A shotgun shell likewise loaded with small shot, is more properly called a "shotshell."

Shot concentrators means for concentrating a shot pattern. The most reliable means is a choke in the barrel.

shot group

Shot group the design or pattern that is made on a target by a series of shots fired under similar conditions.

Shotgun a smoothbore shoulder arm adapted for firing of a charge containing one or more round balls or pellets. By way of illustration, the average twelve gauge shell loaded with one and one-eighth ounces of number six shot contains approximately 253 individual lead pellets. The shotgun was designed for shooting small, winged game such as duck, pheasant, etc.

Shotgun shell, shotshell is the fixed round of ammunition designed for use in a shotgun. It consists of a paper or plastic body, a thin brass head at one end, a battery-cup primer, base wad, powder charge, over powder wad, filler wads, shot charge and folded crimp. Some modern plastic shells make use of a one piece plastic wad that replaced the cardboard and fibre wads used in the older paper shells. Rolled crimp shotshells (now obsolete) require, in addition, the use of a thin cardboard wad over the shot charge. The first shotshell was patented in 1855 by Clement Potter.

Shotgun wedding, shotgun marrige a slang expression for a union forced by a third party.

Shot in the dark, a a common expression to describe an action taken blindly and having the same chance of success as a shot fired in the dark at an unseen target.

Shot locker an old naval designation for a compartment in the hold of a vessel for storing shot and shell.

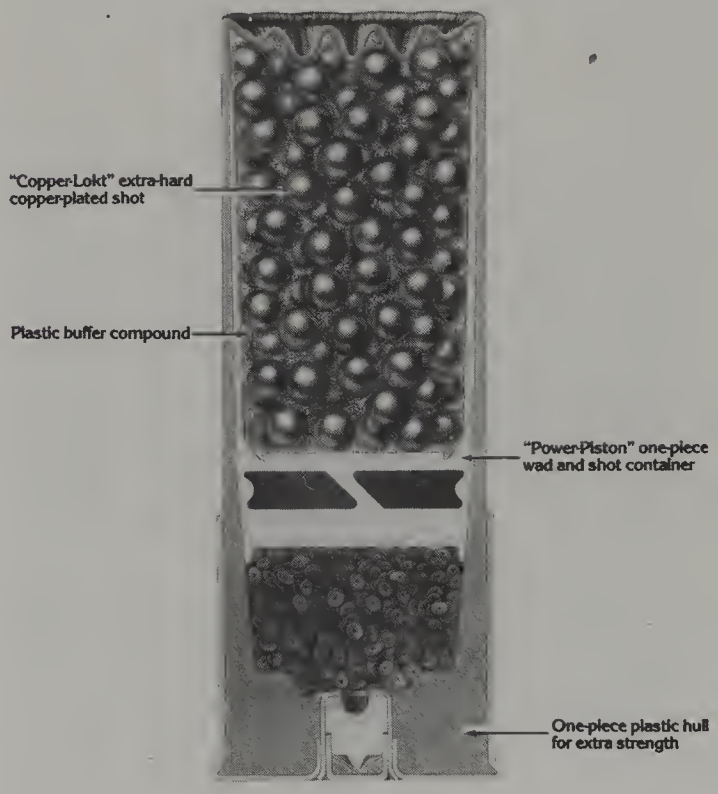
Shot manufacture lead shot reputedly was made as far back as 1420 and used as grapeshot, and by 1510 used in early hand held firearms. A British patent issued in 1758 covered a method of making lead balls by pouring and then polishing in drums. Improvements in manufacture were made in 1782. Initially, shot was made by dropping molten lead, having a little arsenic added, through sieves from high towers, called shot towers, into water 100 to 200 feet below. Screening then separated the various sizes of shot made by this method. Later manufacture consisted in discharging molten lead against a rapidly rotating screen that propelled the drops into water. This dispensed with the need for shot towers. Three general types of shot have been made, soft or drop shot, chilled or hard shot, and coated or plated shot.

Shot pattern the design made on a surface by all the impacts of the shot fired from a shotgun shell, also the design made by a series of shots fired under similar conditions.

Shot peen a method used in metalworking consisting in the bombarding of a steel object with hard steel shot to improve its endurance.

Shot pouch a container of leather or other suitable material for shot, required in the days before shotshells.

Shotshell length the overall length of the shotshell after firing. Because a portion of the casing must be used to close the open end of the shell (with a roll crimp or folded crimp), the new, unfired shell is shorter by the amount of material required in crimping. Shotgun chambers are designed to accommodate the full length of the fired (extended) casing and since most modern shotguns are made with 2¾-inch chambers, it will be found that modern unfired 2¾-inch shotshells actually measure closer to 2⅜-inches. At one time 2½-inch (fired length) shotshells were commonly encountered in the U.S. and are still being made in Europe. These, in the appropriate gauge, can safely be used in the guns having 2¾-inch chambers. Under no circumstances, however, can 2¾-inch shells be used in guns having 2½-inch chambers. Because a modern 2¾-inch shell generally measures less than 2½-inches when loaded, it is possible to chamber it easily in a shotgun designed for 2½-inch shells. Extreme care should be exercised when handling older or unfamiliar shotguns.


"Copper-Lokt" extra-hard copper-plated shot
Plastic buffer compound
"Power-Piston" one-piece wad and shot container
One-piece plastic hull for extra strength

shotshells, plastic

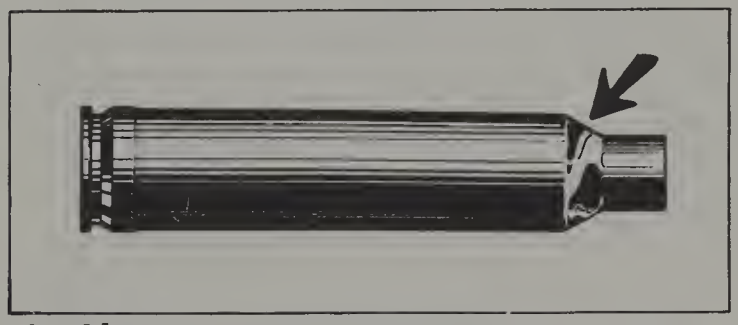
Shotshells, plastic center fire paper shotshells in recent years have been largely replaced by plastic shells provided with a metal head. A further development has been a one piece plastic shell introduced in Denmark and Belgium shortly after World War II, which has a primer-supporting metal insert in the head.

More recently, certain such plastic shotshells are represented to be capable of reuse after firing, i.e., suitable for reloading.

Shot size See Appendix.

Shotting the process of producing lead shot in a shot tower.

Shot tower a tall tower, as high as 200 feet, from which molten lead or lead alloy is dropped through sieves into a chilling liquid, such as water, to form shot.



shoulder

Shoulder 1. the tapered portion of a cartridge case between the body of the case and the neck. 2. the process of shouldering a long gun (rifle or shotgun) prior to aiming and shooting.

Shoulder arm any small arms weapon designed to be fired while held in the hands with its butt braced against the shoulder. The rifle, carbine, shotgun, and automatic rifle are shoulder weapons.

Shoulder holster a holster for a handgun carried by a harness or shoulder strap and supported beneath the arm on the body of the wearer.

Shoulder pad a cushion of fabric, rubber or leather sewn to a shooting garment at the point where the butt of a gun is placed while firing.

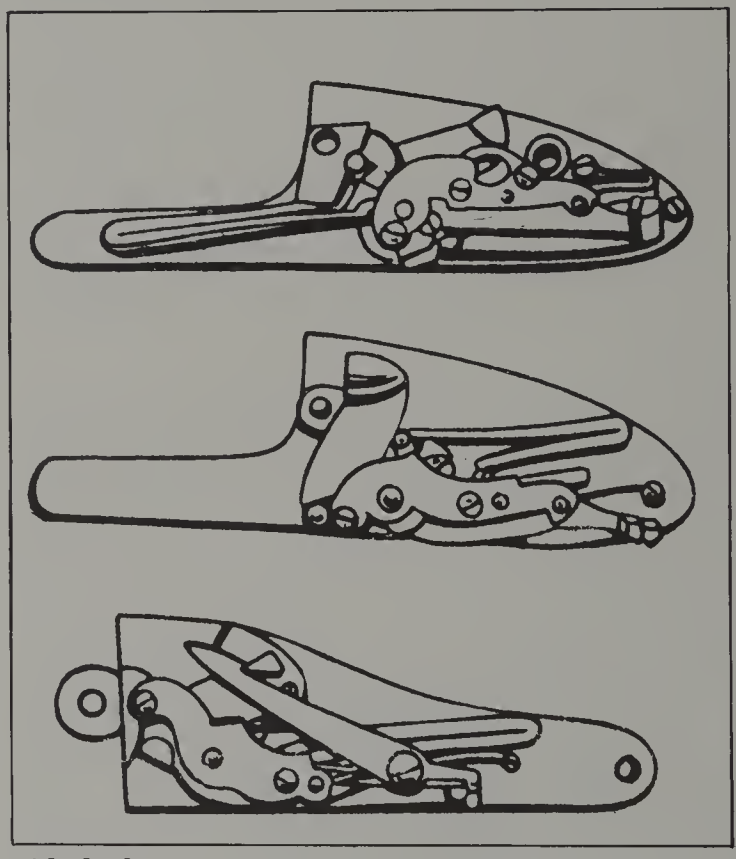
Shrapnel an artillery projectile containing small lead balls that are scattered by a powder charge in the base of the shell set off by a time fuze.

Shrinkage crack in a casting, arises from excessive shrinkage of the metal upon solidification.

Shrinkage fit the fitting of a cylindrical part into a hole; involves making the cylindrical part a few thousandths of an inch larger than the hole, then increasing the diameter of the hole by heating and inserting the cylindrical part. The circular part is gripped with great pressure by the contraction of the heated component upon cooling.

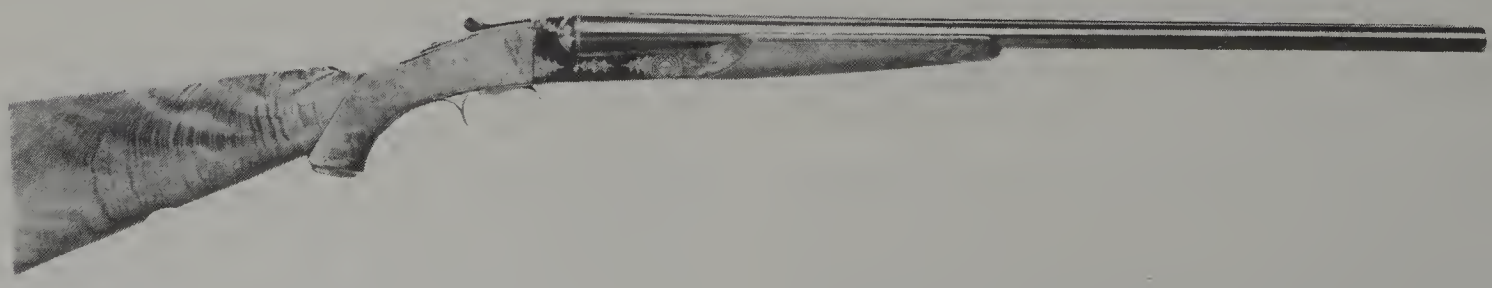
Side arm a weapon worn at the side or in a belt when not in use. A pistol, revolver, sword, bayonet, etc., are side arms.

Side by side a shotgun having two barrels along side of each other. Sometimes abbreviated as S/S.



side locks

Side lock the action mechanism of a firearm assembled on two separate plates and subsequently placed into opposite sides of a gun behind the body of the



side by side

breech. Side lock guns are more efficient than box lock types but are more costly to produce. Two variations of the side lock are found in common use today: the first is called a "bar action" side lock because the mainspring projects from the forward edge of the plate and, therefore, is let into the side of the action bar that extends beyond the face of the breech. The second, called a "back action" side lock, positions the mainspring behind the hammer and results in a somewhat smaller and more compact side plate. It should be noted, however, that some gunmakers retain the profile of the bar action plate when producing a back action lock, therefore it is not always possible to determine the type of lock employed in a particular gun from the profile of the plate. "Box lock" actions, too, are sometimes made with dummy side plates to give the appearance of a side lock action. See "box lock."

Side plate 1. the removable plate on the side of a revolver which, when removed, gives access to the hammer and adjacent parts. 2. the plate of a side lock gun upon which is mounted the firing mechanism. 3. the dummy plates sometimes used to give a high grade box lock action the appearance of the more desirable side lock.

Side split bullet a metal cased bullet having slits in the side wall of the jacket, intended to control its expanding quality.

Sight 1. to aim at a target. 2. to look through a sighting device. 3. a mechanical or optical device for aiming a gun. They may be fixed or adjustable. Mechanical sights may be classed as open or aperture; open being those sighted at or over such as post, bead, notch, etc; aperture, those sighted through such sights as peep, ring, etc. Leaf sights are those that may be folded down for protection.

Sight adjustment the adjustment of the line of sight angularly up or down to allow for range; left or right to allow for windage. The U.S. M14 and M16 have adjustable rear sights that with one "click" or elevation or windage, the strike of the bullet is moved .7 centimeter at 25 meters, 2.8 centimeters at 100 meters, etc., representing one minute of angle.

Sight backlash the play found in screw threads that may be sufficient to require that an allowance be made in setting a sight.

Sight base a mount for a gun sight.

Sight blade a thin metal post used on some firearms as a front sight.

Sight bracket a clamping device used to hold a detachable sight in position when mounted on a gun.

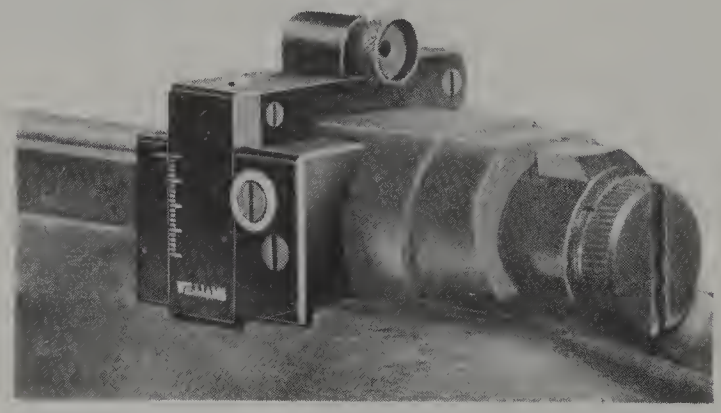
Sight cover a protective metal ring fastened about a sight to guard it from being moved out of adjustment by being struck or jarred, without obstructing the view of the target. Also serves to prevent light reflections off sighting surfaces. Sometimes called a sight "hood."

Sight extension any means for raising or extending a sighting device from its base. A vertical (rising) extension permits sighting at long range; a horizontal extension serves to increase the sighting radius of a firearm.

Sight, front See "front sight."

Sight, illuminated an optical, battery-powered light, housed in a tube mounted on a rifle, or pistol, much like a telescopic sight. The target, without magnification may be viewed through it and, when a spot of light, also seen within the tube, is superimposed on the target, the firearm has been properly aimed.

Sighting bar a wooden bar having enlarged front and rear sights at its ends with an eyepiece mounted before the sight. Used for training in small arms weapons and with movable targets. The eyepiece forces the trainee to hold his eye in proper position and, because of the size of the sights, aiming errors are apparent.



sighting disk

Sighting disk See "aiming disk."

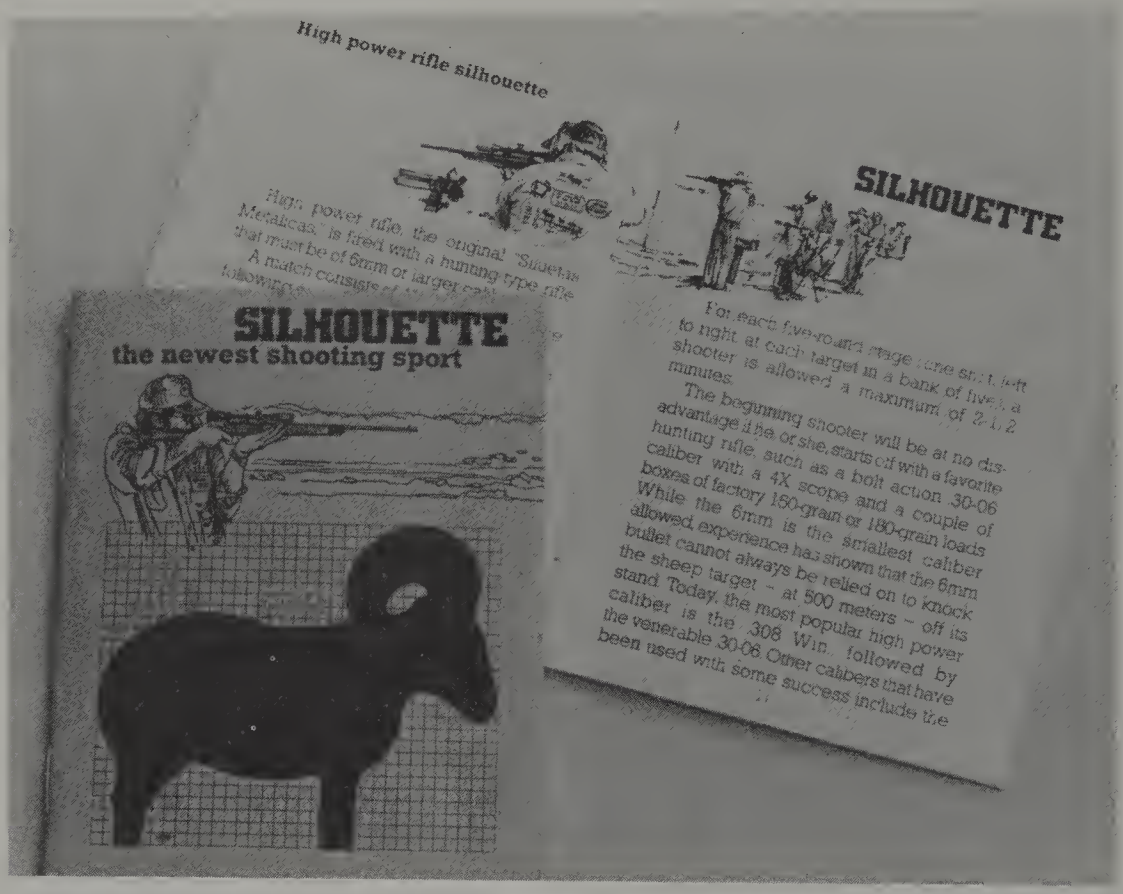
Sighting-in the adjustment of the sights of a gun to conform to the performance of the gun at a selected range. i.e. aligning the sights of a firearm so that the point of impact of a fired bullet will coincide with the point of aim at a predetermined distance.

Sighting shot a trial shot fired to determine if the sights are properly adjusted.

Sight inserts See "inserts, sight."

Sight, leaf the movable hinged part of the rear sight of a gun that can be raised and set to a desired range or laid flat when not in use.

Sight, light scope a light amplifying telescope, hand held or mounted on a tripod or a firearm, for night vision image intensification. An example is the U.S. Army Starlight scope AN/PVS-2, a lightweight scope



silhouette shooting

with 4 power magnification and a range of from 300 to 400 meters.

Sight, line of the line along which the sights of a gun are set and the prolongation of such a line to the target.

Sight radius the distance between the front and rear sight of a gun.

Sight, rear See "rear sight."

Sight, scope an optical gun sight that employs a telescope to increase the ability of the shooter to see in proportion to its magnification. See "scope."

Signal cartridge a cartridge loaded with pyrotechnic powder for ignition and ejection from the muzzle of a gun, usually containing vari-colored luminous balls similar to the roman candle type. Used by the military and by yachtsmen for signalling purposes.

Signal pin See "cocking indicator."

Signal pistol a pistol designed to fire pyrotechnic signals such as flares. Also called a pyrotechnic pistol.

Silencer a device for slowing down the escape of gases at the muzzle of a gun which results in the reduction of the sound of the report. It also acts as a muzzle brake and decreases the recoil of the gun. The first successful firearms silencer was developed by Hiram Percy Maxim in 1909. Production by Maxim Silencer Company discontinued in 1925 for lack of business. The National Firearms Act specifically includes silencers within the scope of its application to the making and transfer of certain firearms.

Silhouette shooting a target sport that originated in Mexico and was introduced in the United States by about 1970. Originally intended for centerfire rifles, the sport was soon expanded to include matches for centerfire handguns. Today there are also scaled-down targets for rimfire and air gun shooting at short range. Instead of paper targets, the shooter fires at heavy metallic silhouettes of game animals and birds, and the targets are spaced at several distances. With the big bore rifle, targets are set up as far as 500 yards from the firing line. For centerfire handguns, the maximum is 200 yards. Shorter distances are specified for rimfire and air gun shooting. The object is to knock over each target-taking only one shot per target. If a bullet strikes a target but fails to topple it, the shot is scored as a miss. For detailed regulations, contact the National Shooting Sports Foundation.

Silhouette target a practice target bearing the outline of a person, animal or object that is readily distinguishable against a light background.

Silica is amorphous silicon dioxide (SiO_2) useful as an abrasive. Finely ground into powder form and blended with varnish and drying agents to form a filling compound used in gunstock finishing.

Silica gel a colloidal form of silica, like coarse sand in appearance but having many fine pores, making it a highly absorbent substance. When placed in a gun cabinet, will dry the atmosphere and prevent rusting of the metal contents. After the pores have become taxed with moisture, it may be placed in an oven to be dried out and reused.

Silver solder a hard solder, usually being an alloy of silver, copper and zinc. Gunsmiths have on occasion used a silver solder of 70 percent silver and 30 percent copper, but more often one having 49.24 percent silver, 34.36 percent copper and 16.4 percent zinc.

Silver soldering the practice of joining metals (such as steel) by means of soldering with a mixture of silver and brazing alloy. Depending upon the properties of the particular silver solder used, melting points range from 900°F to 2000°F. Makers of high quality firearms use silver solder to join the barrels of double guns and for fastening ribs to barrels. Silver solder provides a much stronger bond than ordinary lead-tin solder, but is somewhat more difficult to work with due to its higher working temperatures and fast setting characteristics. Silver soldered components may be hot blued, soft soldered components cannot!

Simulate to pretend or feign, such as is done when practicing aiming, cocking and squeezing the trigger of an unloaded firearm. See "dry firing."

Simulated pretended or imitated. For example, simulated ammunition may be of wood or other inert material suitable for practice purposes; simulated fire is going through the motions of firing without actually firing.

Single action in a revolver it is an action that requires the gun to be manually cocked, an operation that rotates the cylinder, places a chamber in alignment with the firing pin and holds the hammer back in readiness for a squeeze of the trigger which fires the gun. Trigger pressure will not perform such operations.

Single ball load one round lead ball used in a shotgun for large game animal shooting. The rifled slug is more accurate. See "rifled slug."

Single base powder made of nitrocellulose (guncotton) dissolved in ether and alcohol then extruded, dried, and formed into granules, flakes or cylinders. Also called nitrocellulose powder.

Single bore powder made of nitrocellulose (gun cotton) dissolved in ether and alcohol then extruded, dried and formed into granules, flakes or cylinders. Also called nitrocellulose powder.

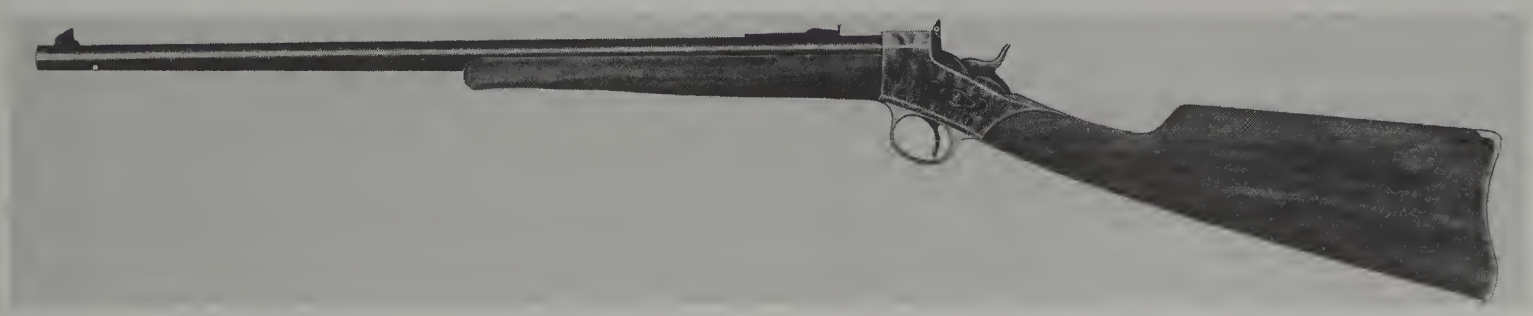
Single-double triggers an unusual and somewhat rare trigger system found in double barrel shotguns. With this mechanism the shotgun is equipped with what appears to be conventional double triggers, positioned one behind the other. However, the forward trigger is, in reality, a non-selective single trigger which will fire the right barrel with the initial trigger pull and the second (left) barrel upon a subsequent pull. (When found on over & under shotguns, the lower barrel fires first, followed by the upper barrel.) The second or rearmost trigger fires only the left (or upper) barrel. In this manner the shooter has the advantage of a single trigger for the normal open choke-tight choke firing sequence. On those few occasions when he might need only the tighter choke, he simply employs the rear trigger. Single-double triggers are generally complex, trouble-prone mechanisms.

Single loader See "single-shot weapon."

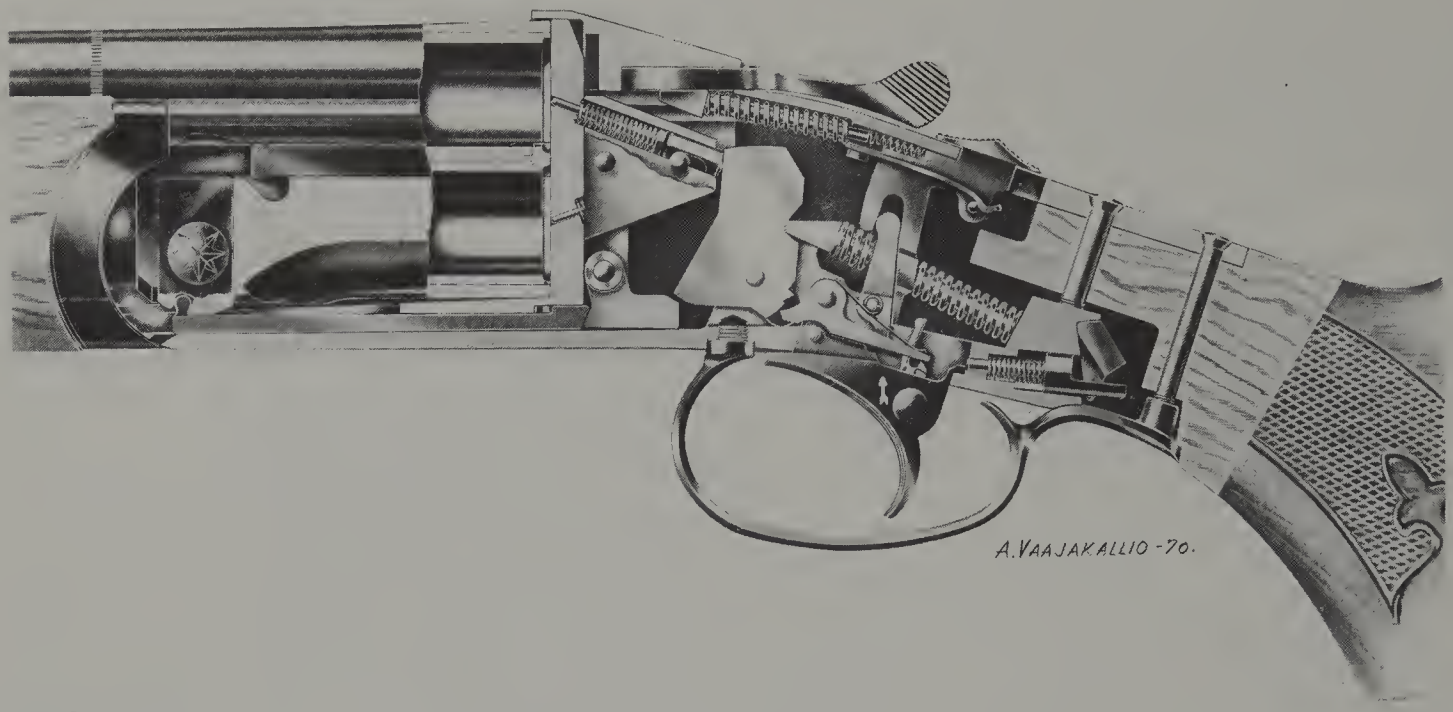
Single shot the production of a spaced shot by reason of loading by hand for each shot, or in the case of a repeating firearm, by squeezing the trigger for each shot.

Single shot weapon a gun capable of receiving and firing but one hand loaded round for each shot. Also called a single loader.

Single trigger a trigger mechanism that permits both barrels of a double barrel gun to be fired by sep-



single shot weapon



single trigger

arate pulls of the same trigger: may be selective or non-selective. A non-selective single trigger fires each of the two barrels in the same constant sequence — a sequence that cannot be reversed. A selective single trigger permits adjustment of the trigger mechanism, by means of a selector, so that the shooter can elect which of the two barrels he prefers to fire first — the opposite barrel can then be fired upon a second pull of the trigger.

Sink box a shooting boat or moored platform once employed in waterfowl hunting. The sink box was designed to ride very low in the water so that only inches of it appeared above the water's surface. Because of the low silhouette, waterfowl would come into the decoys more readily. For this reason sink boxes are now prohibited by law.

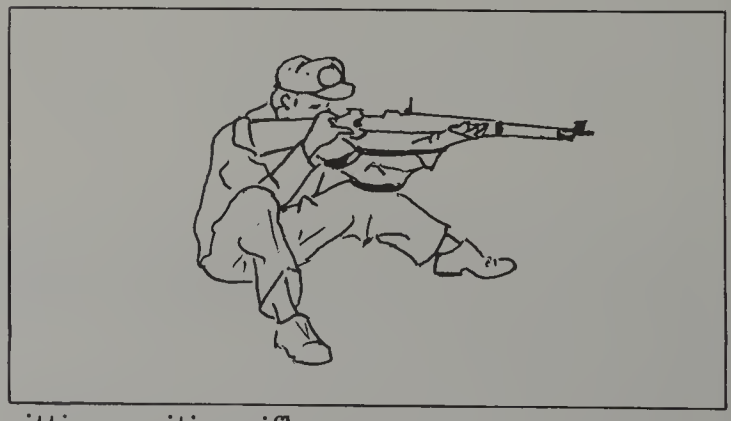
SINOXID trade name for the now famous non-mercuric, non-corrosive priming mixture developed by the German RWS firm during the late 1920's. See "RWS."

Sinter the molding and heating (usually under pressure) of a powdered material to form a solid, coherent mass. In sintering, the powdered material is never actually heated to its melting point.

Sinterloy a powdered metal that, under a pressure of 50 tons per square inch, is shaped and then, under temperatures of 1965 to 2100 degrees F., sintered to produce a dense homogeneous steel. Used in the manufacture of gun parts to avoid cutting and machining shapes from blocks of metal.

Site the location. Sometimes the angle of site is merely called "site." See "angle of site."

Sitting position, handgun as prescribed in U.S. Army and Air Force training, the shooter is seated with knees bent and knees and feet about 6 inches apart. Both elbows project beyond the knees allowing the fleshy part of the arms to make contact with the knees. For a heavily built shooter it may be necessary to place the fleshy part of the forearms on the knees. To place the gun at eye level the feet should be positioned closer to, or farther away from the body. With a proper two-hand grip the gun is aimed at the target.



sitting position-rifle

Sitting position-rifle one of the standard postures used in firing a rifle. In this position the shooter sits

half-facing to the right, legs apart, heels well braced into the ground and body bent forward. The weight of the rifle is supported by resting the elbows between the legs or upon the shins.

Six gun, six shooter a common term for revolvers arising out of the fact that most are chambered for six cartridges.

Six o'clock hold aiming a firearm by aligning the sights on the bottom edge of a bullseye rather than on its center.

Sizing as used in the handloading of cartridges, it is the bringing back to proper dimension the fired case that has become enlarged as the result of its prior use. Lead bullets are also sized, after casting, to give them the desired dimensions.

Sizing die a tool used in reloading operations to restore fired cartridge casings to original dimensions.

Skeet a form of wing shooting sport in which inanimate clay targets are thrown into the air by mechanical "traps" (throwing devices) and shot at with shotguns of 12, 20, .410 or 28 gauge. The skeet field consists of two trap houses (one high and one low house) located 120'9" apart. A segment of a 21 yard-radius circle, the base of which comprises a straight line between the trap houses, is made up of eight shooting stations. Targets from the high house, at the left of the base line emerge at a point 10 feet above ground level and are directed to fly over the "target crossing point" which is marked by a stake 18 feet directly in front of position 8. Targets from the low house emerge at a point 3½ feet above ground level and are also aimed to fly over the target crossing point. A skeet squad is normally composed of five shooters and one full round consists of twenty five shots, the object being to score the greatest number of "dead" targets. The round is comprised of one single target from each trap house taken at each of the eight stations. Following the singles shooting at stations 1, 2, 6 & 7, one set of doubles (one target from each trap house fired simultaneously) must be shot. This accounts for 24 targets. The 25th is made up by repeating the first missed target from whatever station the shooter happens to occupy at the time of the miss. In the event a shooter breaks all 24 targets, he must fire at a third target from station 8 to account for the 25th bird. For quite a long time, prior to this ruling, he was given his choice of stations, and houses, for the 25th shot. Following is a table showing the average "leads" for each target in skeet shooting:

Station	*High House*	*Low House*
#1	6" below	6"
#2	1 foot	1½ feet
#3	1½ feet	2½ feet
#4	3½ feet	3½ feet
#5	2½ feet	1½ feet
#6	2 feet	1 foot
#7	6 inches	dead-on
#8	dead-on	dead-on

Skeet field See "skeet."

Skeet gun the average skeet gun is an over & under, automatic or slide action shotgun in 12, 20, .410 or 28 gauge. In the 12 or 20 gauges, the skeet gun will weigh approximately seven pounds and will be equipped with 26-inch skeet choked barrels. In .410 or 28 gauges, the skeet gun may weigh as little as six pounds and may be equipped with 28 inch barrels. Skeet guns, in all gauges, are generally equipped with raised ventilated or solid ribs fitted with front and middle bead sights. While most skeet shooters prefer stocks made to their own specific dimensions, most factory models are made with stocks having a

skeet gun

14-inch length of pull, 1⅝ inch drop at comb and 2½ inch drop at heel. Skeet guns are rarely equipped with recoil pads. Skeet Chokes: contrary to popular belief there are no prescribed dimensions for skeet chokes. The terms Skeet #1 and Skeet #2 are used by virtually all gunmakers, but dimensions will vary from make to make depending upon each manufacturer's experience with pattern percentages at skeet distances. Because the average skeet shot is made at comparatively close range, skeet chokes are designed to yield the largest possible patterns at ranges of from 15 to 20 yards. Consequently, skeet chokes are cut to dimensions somewhere between the field gun equivalents of true cylinder and improved cylinder. Most field guns having barrels with improved cylinder chokes can be used satisfactorily on the skeet range.

Skeleton buttplate a buttplate with its center part cut away exposing the stock at its butt end.

Skeleton stock a frame, rather than a solid piece, constituting the stock of a firearm. It may be an integral or detachable piece. Designed to reduce the weight of a weapon so equipped.

Skelp strips of wrought iron, steel, etc., that are used for making tubes by bending around a cylindrical form and then welding. Damascus barrels were made with strips or strands of metal that can be properly referred to as skelp.

Skirted pellet a pellet for an air or CO_2 gun that flares outward from its waist-like constructed midsection to its base. Also called a waisted pellet.

Skoda an automatic machine gun patented in 1888 and named after the famous Czech arms center. Adopted by Austria in 1893 as an official military arm and with modifications continued in use for many years.

Slack looseness or play in the mechanism of a gun, as for example the play in the trigger or distance that the trigger must be taken up before firing pressure is felt. Most noticeable in military weapons which are equipped with two stage triggers for safety. The first stage is simply travel (or slack) — the second stage, normal firing pressure.

Slant range an angle of fire, either up or down, when the target is located, vertically, above or below the level of the bore. Since gravity is quartered toward the nose or tail of such a projectile, in both instances it will tend to fly higher than the line for which it was zeroed on a level plane. Following is a table of average big-bore slant-range factors that will serve the mountain hunter:

Up or down firing angle	Slant range factor/multiplier
20°	.94
25°	.91
30°	.87
35°	.82
40°	.77
45°	.70

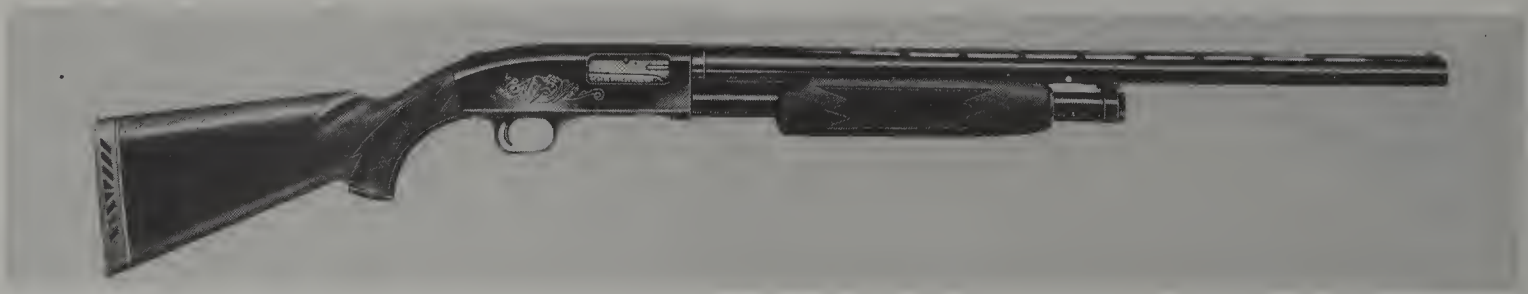
Angles of less than 20° have so little effect on the path of the bullet that they can be ignored for all practical purposes. To use these slant-range factors one must know the precise range for which the rifle was zeroed on the level. Then he must know where the bullet will strike if fired at a shorter or longer distance. Finally, and if for example, the rifle is zeroed for 200 yards and the shooter finds a desireable target at 350 yards, some 45° above or below his shooting position, he multiplies 350 × .70 = 245 (yards) and must know how to hold for a target at that distance (as if he were shooting over a level range.)

Slave pin a pin used as a temporary substitute for a pin that is normally used in firearms assembly. Its use is during maintenance or repair work and not when the gun is in service.

Slew swing a gun sidewise, that is, traverse a gun.

Slide 1. the sliding member of the receiver of certain automatic weapons. In semiautomatic pistols, a metal sleeve embracing part or all of the barrel and/or the top of the action, forming or housing the breechblock. Driven back by recoil it is returned to firing position by spring action. 2. in slide action guns (sometimes called pump guns) the slide is that portion of the gun that is gripped by the forward hand and which is slid back and forth to clear and reload the weapon.

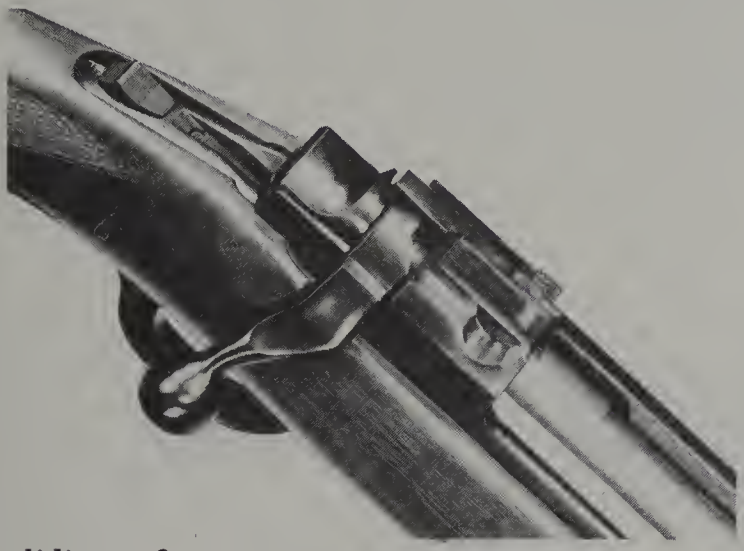
Slide action the mechanism of a repeating rifle or shotgun operated by the manual movement of a slide



slide action

under, and parallel to the barrel. (Sometimes called pump action or trombone action.)

Sliding breechblock another name for a "falling block."



sliding safety

Sliding safety a safety mechanism on a rifle or shotgun that is operated by means of a sliding, two position, safety button.

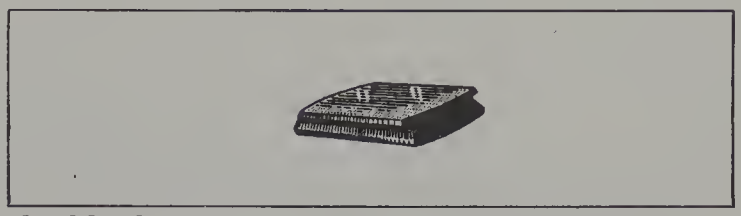
Sling a strap (usually of leather although occasionally of webbing) that is attached to a rifle or carbine to facilitate carrying. Also used to aid in steadying the gun while shooting. To serve as a shooting aid, a sling must be adjustable for length. A non-adjustable sling is more properly called a "carrying strap."

Sling ring a large metal ring free to move within an eyebolt or sling bar that is secured to the underside of a carbine and through which a sling may be passed. Such a sling may be attached to a saddle or looped over the rider's shoulder to prevent the carbine from dropping out of reach.

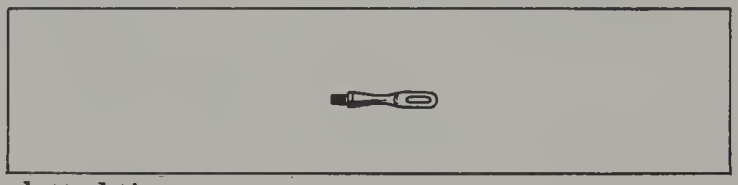
Slip shooting a rapid fire method of firing a single action revolver which consists in holding the gun in one hand with the trigger held back, tied back or removed entirely, and with the other hand clasping the gun pressing the hammer back with the thumb permitting the thumb to slip off when the hammer has reached full cock.

Slot 1. a narrow groove or opening. 2. a dovetail slot: tapered female slot, usually about ⅜th of an inch in width, cut into the barrel of a firearm to form a base for a sighting device. All such dovetails are tapered from right to left (as one aims the weapon) to remove them, sights should be driven out from left to right; new sights are installed from right to left.

Slot blank a dummy filler plate employed to fill an unused dovetail slot.



slot blank



slotted tip

Slotted tip a slotted jag used on cleaning rods to hold a soft cloth cleaning patch.

Slow fire a rate of fire common to target shooting for which there is no pressing time restrictions. Although in present day competition, because of the number of competitors, slow fire matches are held under prescribed time limits, these limits are such that even the slowest shooter will find them easy to cope with. For example, in slow fire handgun competition, the shooter is usually permitted one minute per shot, firing ten shots in ten minutes.

Slow match a wick soaked in a solution and dried, adapted to burn slowly when held in a C-shaped piece of metal or in a Serpentine, to be available to ignite the powder at the touch hole of a matchlock musket.

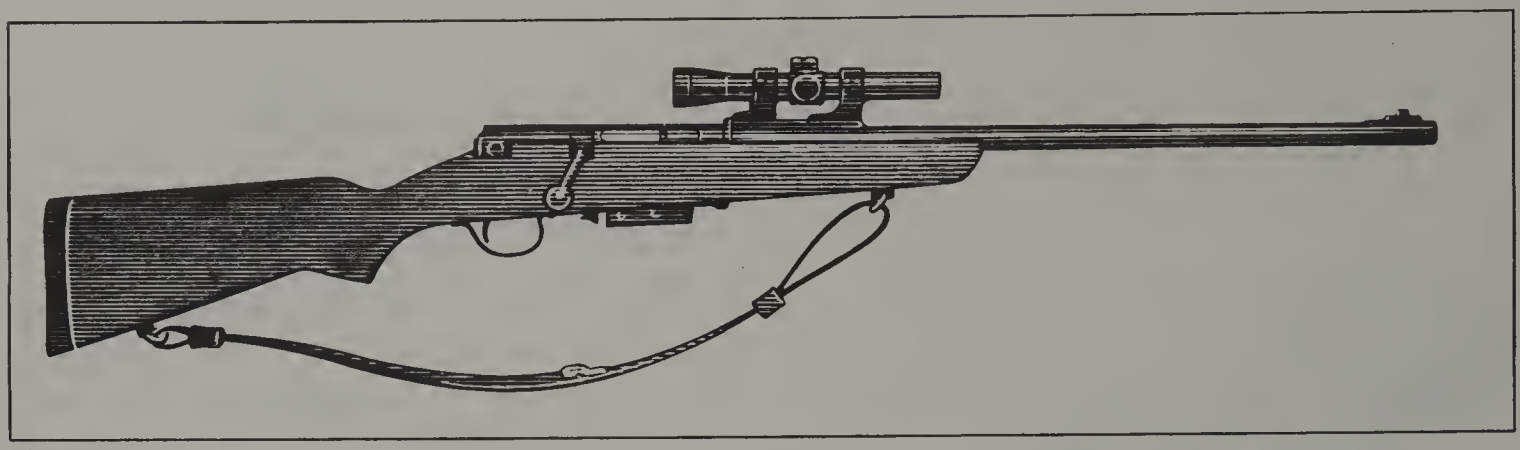
Slow pull a target released after a noticeable delay from the time the shooter called for it. Common practice in international style skeet shooting but cause for target refusal in American forms of skeet and trap.

Slug 1. the British engineering term for a unit of mass, equal in pounds to the number of feet per second, per second of acceleration of a freely falling body at a specific point in its flight. It has the property that a force of one pound acting upon a mass of this unit produces an acceleration of one foot per second per second. 2. the term applied to a solid lead projectile used in shotgun shells for the shotgun hunting of big game. 3. as a colloquial expression: broadly used in referring to any size or type of bullet. See "rifled slug."

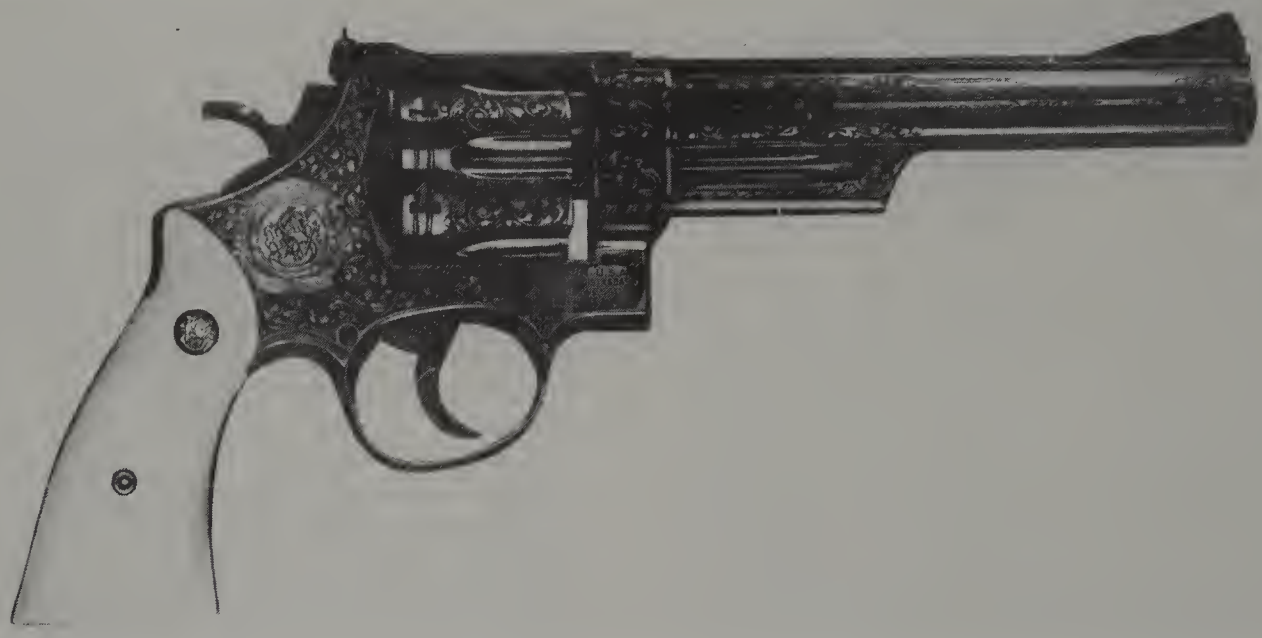
Slugging the bore the process of forcing a slightly oversized round ball of pure lead through the bore of a barrel for the purpose of accurately determining the minimum bore and groove dimensions of the barrel.

Slug gun a shotgun designed specifically for big-game hunting with the rifled-slug. Invariably equipped with a short barrel (about 22-inches long) and rifle-type sights.

Slush an artillery term meaning to clean or oil the bore of a cannon with a compound or lubricating oil.



slug gun



smith & wesson

Slush brush an artillery item usually a cylindrical piece of wood fastened to a long rod and covered with a wool or carpet pad and used to coat the bore of a cannon with oil or a cleaning compound.

Small arms guns that can be carried and operated by one man. They include shoulder arms, sometimes called long guns, hand guns, (pistols and revolvers) and machine guns. Generally firearms with calibers up to 1 inch in diameter are so classified.

Small arms ammunition ammunition having a bullet diameter of one inch or less, used in small arms.

Small bore (or smallbore) generally used to refer to anything in the .22 caliber rimfire family.

Smallbore practice shooting practice with .22 caliber rimfire ammunition.

Small of the stock that part of the stock of a small arms weapon usually gripped by the right hand, lying just behind the receiver and trigger assembly. In some stocks a pistol grip is shaped at this location. Specifically it is that portion of a long gun stock where the wood is at its thinnest dimension.

Smith a carbine hinged at its breech, designed by Gilbert Smith and used during the Civil War. The rifle using the same system and also called Smith was well received in Europe.

Smith, Horace (1808–1893) an American gunsmith and inventor who obtained his first patent for a breechloading rifle in 1851. He cooperated with Daniel Wesson in developing a metallic cartridge and is perhaps best known as the "Smith" of Smith and Wesson fame.

Smith & Wesson a trademark of the firearms manufacturing firm of Smith & Wesson Inc., of Springfield, Massachusetts.

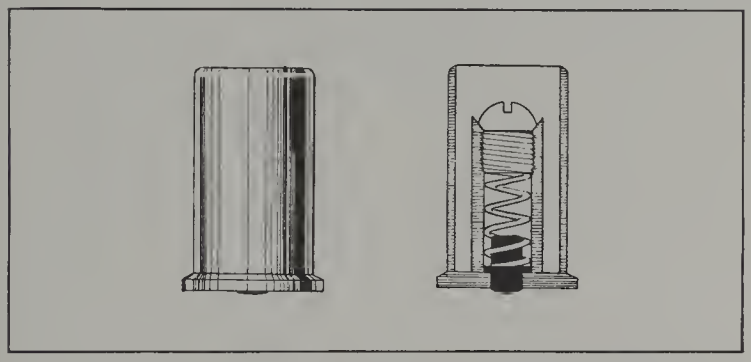
Smoke in claybird shooting, a term to describe a target hit so forcefully that it disintegrates in a puff of smoke.

Smokeless powder it is neither smokeless nor a pow-

der but when ignited burns with a minimum of ash and smoke, and it is produced in the form of small flakes, strips, pellets, cylinders and other shapes. The single base powder is a chemical compound made from nitrated cellulose colloided with ether-alcohol. The double base powder uses both nitrocellulose and nitroglycerin as a base. Used as a propellent in firearms. It is no more dangerous to store, handle or use than celluloid and much less dangerous than gasoline. French chemists worked to obtain smokeless powder as early as 1832, but not until 1884 did French engineer Vieille produce the first successful smokeless powder.

Smoothbore a gun whose barrel is not rifled, such as those of former years called a musket, fowling piece, or blunderbuss. A shotgun is a smoothbore weapon.

Snail trigger guard a trigger guard found on vintage European rifles and shotguns that got its name from its downward and backward sinuously-curved rear portion.



Snap cap a dummy cartridge fitted with a cushioned or spring-activated button in place of the usual primer assembly. Used to prevent damage to firing pin tips when dry firing.

Snaphaunce, snaphance an improved muzzleloader that replaced the expensive wheel mechanism of the wheellock. It carried a piece of pyrite or flint between jaws at the end of the spring tensioned cock. When the trigger was pulled the cock was released causing the pyrites or flint to strike a glancing blow at the steel anvil (later to be part of the frizzen of the flintlock), thus igniting the priming powder. Some authorities claim it appeared on the scene as early as 1525, others that it came into use between 1530 and 1570.

Snap lock 1. a final form of matchlock in use in Europe from the 1570's on, which provided a tube as a container for a piece of tinder or short section of match, thus avoiding a long, exposed piece of dangling cord whose lighted end could be seen by an enemy. 2. also termed snap locks were the Scandinavian locks, Swedish (1547), Norwegian (1562), Danish (1565) used from those dates on, which were an early version of the flintlock, using iron pyrites to strike steel and produce a spark.

Snapshot a hurried or quick shot fired with little or no calculated aim — instinct shooting. See "pot shot" for distinction.

Snider a rifle so named after Jacob Snider of New York who, in 1864, submitted what the British held to be the best method of converting its Army's muzzleloaders into breechloaders. It was the first breechloader generally issued to the British Army.

Snider, Jacob an American whose system for converting the British muzzleloaders to breechloaders was officially adopted by the British in 1867.

Sniper military name for a concealed sharpshooter who, generally at long range and with a telescopic sight, selects as his targets, individual soldiers.

Sniperscope an electronic infrared sight or scope permitting a shooter to see and aim at a target in complete darkness. Developed during World War II by the U.S. Army.

SNL abbreviation for Standard Nomenclature List.

Snub nosed a term commonly used to describe a short-barrelled revolver, such as those carried by law-enforcement officers when off duty.

snap caps

snubnosed

Soapstone See "talc."

Society of Automotive Engineers abbreviated as SAE, founded 1905, annually publishes the SAE Handbook, a book of standards for various grades of materials used in the automotive industry but whose standards are frequently included in specifications for other manufacture.

Sodium nitrate also known as nitrate of soda, or Chile saltpeter, whose chemical symbol is $NaCO_3$. Used as a source of nitric acid and used in fluxes and in pyrotechnics. Black powder may be made by mixing it with sulphur and charcoal.

Soft hammers hammers made of brass, babbitt metal, plastic, wood, hard rubber, copper, lead or rawhide and used to avoid marring finished surfaces or to avoid upsetting the end of a bolt, pin, etc.

soft point bullet

Soft point bullet a lead core encased in a jacket of harder metal except at the nose where the lead is exposed. Bullets so made expand more readily and have as a result, greater stopping power.

Soft point, side split bullet a lead core encased in a jacket of harder metal except at the nose where the lead is exposed. It has slits running from the open end of the jacket, part way down the side. It is used where maximum expansion on impact is sought.

Soft shot another name for drop shot. See "drop shot."

Solder usually an alloy of two or more metals. Soft solder is basically lead and tin; hard solder, copper and zinc, sometimes also with silver, aluminum solder is basically tin with the addition of just zinc or zinc and aluminum. The mixes used are designed to produce a lower melting point than those of the metals to be joined, yet to have a fusing point as close as possible to that of the metals.

Soldering the practice of fusing two metallic surfaces together by means of melting a third metallic substance between them.

Solid the English term for a full jacketed bullet.

Solid frame in a revolver is one having no hinge in its frame. In this type the cartridges are either unloaded singly, as past a loading gate, or by removing the cylinder from the frame by pulling out the axis pin. In a rifle or shotgun it refers to one not readily separated into its component barrel and receiver portions.

Solid lead bullet a bullet made of lead alloy, the kind and amount of alloy determining the hardness of the lead. Tin and antimony are commonly used as hardening alloys.

Solvent a strong chemical solution designed to loosen or dissolve powder and lead residues in firearms. Most firearms solvents are highly erosive and should not be left in contact with metal surfaces indefinitely but should be carefully rinsed from steel surfaces by means of a neutralizing gun oil.

Sound 1. the sensation of hearing. 2. tone or noise. Sound is propagated by progressive longitudinal vibratory disturbances called sound waves. The speed of sound in air at 68° Fahrenheit is 1129 feet per second. Thus, with no wind, if the time between when an observer sees a muzzle flash and hears the report of the gun is 5 seconds, the gun is over a mile away.

SP abbreviation for soft point bullet, a bullet partially jacketed leaving some lead exposed at the nose.

Spall a chip or fragment of stone. When reference is made to a gunspall, it refers to a hard stone chip used to produce a spark in a snaphaunce or flintlock ignition system. See "gunspall" and "gunflint."

Spanner a wrench or key for winding the spring on a wheellock.

Specific gravity is, in general terms, the ratio of the weight of any volume of a substance to the weight of an equal volume of water. Aluminum with a specific gravity of 2.7 is that many times the weight of water of equal volume. Thus, one cubic foot of aluminum weighs 2.7×62.5, or 168.7 pounds.

Specifications a clear and accurate technical description of the characteristics of a material, an article, or a service so that it may be faithfully reproduced.

Specific heat the number of heat units required to raise the temperature of a given weight of substance one degree. In the metric system the number of calories required to raise one gram one degree C; in the English system the number of BTU's per pound per degree F.

Speed quick motion or rate of motion (velocity).

Speedlock all firing mechanisms are called locks, however, a speedlock is a firing mechanism that is designed to transmit the trigger action to the cartridge in the shortest possible time. This is accomplished by minimizing the travel of all moving parts from the trigger, through the sear engaging surfaces, to the firing pin. True speedlocks are much desired for target shooting purposes because they help the shooter get each shot off at precisely the right moment — every split second of delay, from the time the trigger is activated, serves to handicap accuracy. Speedlock actions are most expensive to produce and, for that

reason, are usually found only in highgrade target rifles.

Spelter refers to zinc, generally when in the form of ingots.

Spencer a repeating caliber .52, 7 round carbine, the first successful repeater, made by Christian M. Spencer in 1860, put into production in 1862 and used by United States Cavalry units until about 1873. The name also was applied to rifles using Spencer's invention.

Spencer, Christopher Minor (1833–1922) an American manufacturer and inventor. In 1860, he invented the first successful repeater, a 7 shot rifle with a tubular magazine in the stock. The users of the Spencer rifles and carbines during the Civil War considered them to be the finest shoulder guns then available.

Spent, spent bullet used up or without power or force, such as a bullet that has been deprived of its energy.

Spin a whirling or rotating movement such as is imparted to a projectile when it passes through the rifled bore of a gun.

Spiral another term describing the pattern of rifling lands and grooves cut into the barrel of a firearm, although a spiral mathematically is a curve having a constantly increasing radius of curvature. Helical is the proper term.

Spire point bullet a term used to describe a sharply pointed bullet shape.

Spitzer a bullet having a sharp point for the purpose of giving it greater ballistic efficiency.

Spline a flat strip for insertion in a groove between parts. It also refers to the keyway for such a key.

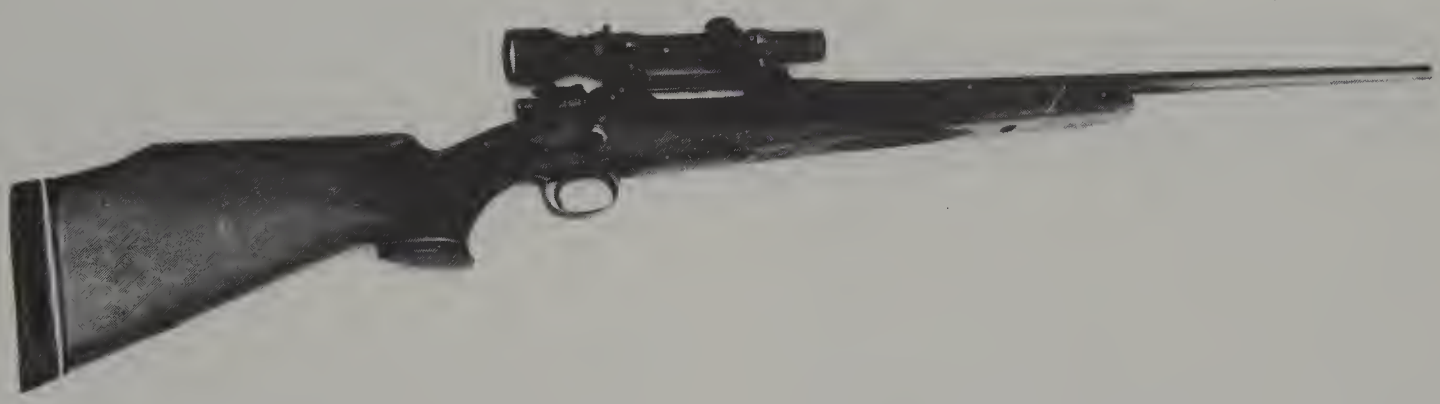
Split body in a cartridge is a logitudinal crack in the case near the head. It is a dangerous defect since it allows gas to escape to the rear.

Split neck in a cartridge is a crack in the neck of the case, usually a season crack hastened by failure to properly anneal the neck.

Spokeshave a miniature form of drawknife used by model makers and gunstock makers for removing minute particles of wood.

Spontaneous combustion a burning that starts as the result of heat generated by chemical action without initiation from an outside source.

Spool magazine a rotary form of magazine having a spring activated follower, believed to have been invented by Schulhof in 1885. However, the first commercially successful rotary magazine was developed by Ferdinand Ritter von Mannlicher of Austria's Steyr Works in 1887. See "rotary magazine."



sporterize

Sporterize the practice of converting a military rifle into a sporting firearm. This generally involves stripping it of military accessories, cutting down or replacing the stock, replacing military sights, altering the bolt handle, modifying or replacing the two stage military trigger and, in some cases, cutting the barrel down to sporter length. Most military rifles weigh nine or more pounds and it is necessary to reduce their weight to approximately seven pounds in the sporterizing process. Sporterizing is usually limited to bolt action rifles.

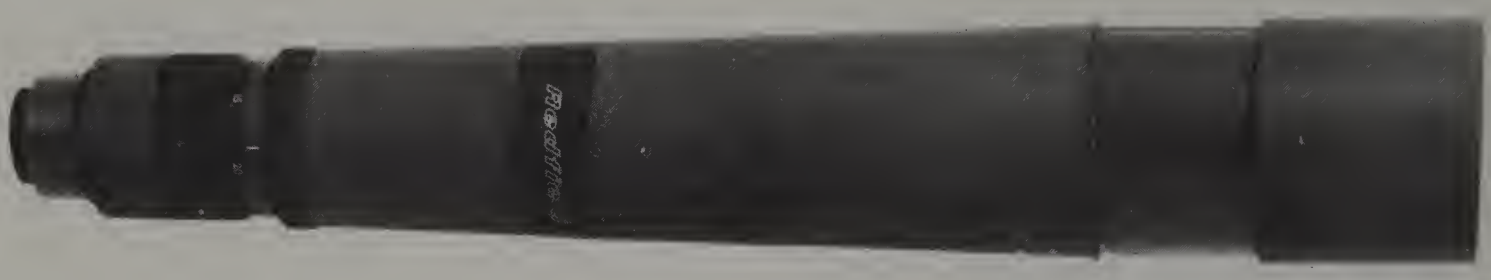
Sporting Arms and Ammunition Manufacturer's Institute a trade association comprised of the leading U.S. manufacturers of sporting firearms, ammunition and smokeless powder. Founded in 1926 and operated continuously since that date to serve the mutual interests of the industry and American sportsmen, headquartered at 420 Lexington Avenue, New York City, New York.

Sporting gun any firearm designed expressly for sporting purposes. All other weapons fall into defense, police, or military categories.

Spot annealing the softening of a small area in a

hardened steel surface by spot heating, after which the work is permitted to cool slowly. Spot annealing is often necessary where holes are to be drilled and tapped in a hardened steel receiver for the purpose of attaching a scope mount or sight.

Spotter 1. a disc mounted on a long wooden pole and used by the target operator in the pit to show the shooter where his bullets are striking the target. 2. one who observes hits on a target through a spotting scope from a position immediately behind the firing line.



spotting scope

Spotting scope the term applied to a conveniently mounted telescope used to spot the hits made on a distant target. Spotting scopes are generally of about 30-power magnification.

Spot welding the welding of two parts together by having raised projections or ridges on their abutting surfaces and passing a current of electricity across them.

Springfield Armory located in Springfield, Massachusetts, was authorized by Act of Congress in April 1778 as an ammunition laboratory. In 1795, it began the manufacture of muskets. From then on it was a small arms manufacturing center for the U.S. Army.

Springfield rifle United States 5-shot repeating rifle .30 caliber, model 1903. It is a breechloading magazine fed, bolt operated weapon.

Springing the rammer a term applied to the test used in determining if a muzzleloading firearm is loaded, which consists of dropping a metal-tipped ramrod into the bore: a metallic sound denoting an unloaded condition while a dull thud, a loaded condition. Appropriate precautions are required when making this test.

Spring plunger a plunger actuated by a helical spring, but always in a fixed position until pulled back by hand or mechanical means.

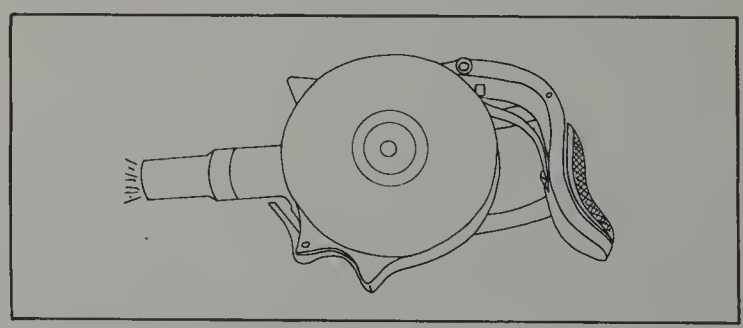
Springs are resilient members used in guns to quickly restore movable parts to their normal positions or to lock parts together. For example, flat springs are used to permit a gun to be cocked and fired, coiled springs to absorb recoil and restore the breech-block to normal position, a notched spring to hold a magazine within the grip of a pistol.

Sprue the hole through which molten material is poured into the gate and into the mold. Also the name given the waste piece cast in this hole.

Sprue hammer a hammer having a rearward projection which may be used to cock the weapon.

Spur trigger an oblolete trigger used on old revolvers and pistols having no trigger guard, but being partly housed and protected in a spur-like projection on the bottom of the frame or receiver. The trigger extends slightly in front of this projection.

Squatting position a posture used in firing a rifle; rarely used in target competition but frequently employed in the field. In assuming the squatting position the shooter faces half-right and, keeping his legs rather close together, squats so that his weight is evenly divided on both feet. The right upper arm is then braced against the right thigh; the left upper arm is rested against the inner flat of the left shinbone. The body weight is transferred slightly to the left foot immediately before firing.



squeeze palm pistol

Squeeze palm pistol popular about 1880, had a cir-

cular grip and firing mechanism that would fit into the palm of the hand permitting the barrel to project outward between the fingers of the clenched hand. It was fired by squeezing the hand, thus compressing the trigger against the grip portion.

Squeezer pistol another name for a palm pistol.

Squib 1. a firework characterized by a hissing noise when ignited and burning, ending in an explosion or, in some kinds, merely burning. 2. the term "squib load" refers to a cartridge or shell that does not develop normal pressures.

Squirrel gun a colloquial term for a light caliber muzzleloading weapon of the early 1800's, generally refers to weapons of .36 caliber or less. Present day squirrel guns are usually of .22 rimfire caliber.

SS abbreviation for single shot.

S/S abbreviation for side by side, a shotgun having two barrels alongside of each other.

ST abbreviation for single trigger.

Stabilizer an attachment for the barrel of a small arm to minimize muzzle jump.

Stacking rod a rod projecting ahead of the upper band of certain military rifles to permit interlocking with other stacking rods to stack the arms so equipped.

Stacking swivel the hinged hook near the muzzle end of a military rifle by means of which several rifles may be fastened together to form a stack.

Stage in match competition the position, range, or timing under which a segment of the match is held.

Stag grip a pair of grips made for a pistol or revolver from genuine, or imitation, staghorn.

Stainless steel generally a low carbon alloy steel with 9 to 20 percent chromium, and resistant to rust. Used for gun barrels to a limited degree.

Stamping basically the economical forming of a part from sheet stock by means of a press, punch and die. The product is usually referred to as a stamping. In some firearms stampings are used for floor plates, trigger guards and similar parts. In some instances, depending upon its shape, the composition of its alloy and the uses to which it will be put, a stamping can be more desirable than a comparable machined component.

Stance the mode of standing or the standing posture of a person. In the case of a shooter, a position appropriate to his weapon, target, range, rules and his own physical characteristics.

Stanchion gun a pivot gun such as a gun fixed to a boat on a pedestal mount.

Stand a vantage point selected by the hunter when game is being driven. The "stand" is a place where the hunter remains as quiet and motionless as possible in hopes of spotting a suitable target.

Standard 1. an accepted or estabished rule or model. 2. the classification given to supplies and equipment that are accepted for general use in the United States military services.

Standard muzzle velocity the speed at which a given projectile is supposed to leave the muzzle of a gun. This depends upon the gun, the propelling charge and the size, shape and weight of the projectile. Firing tables are based on standard muzzle velocities. See "standard trajectory."

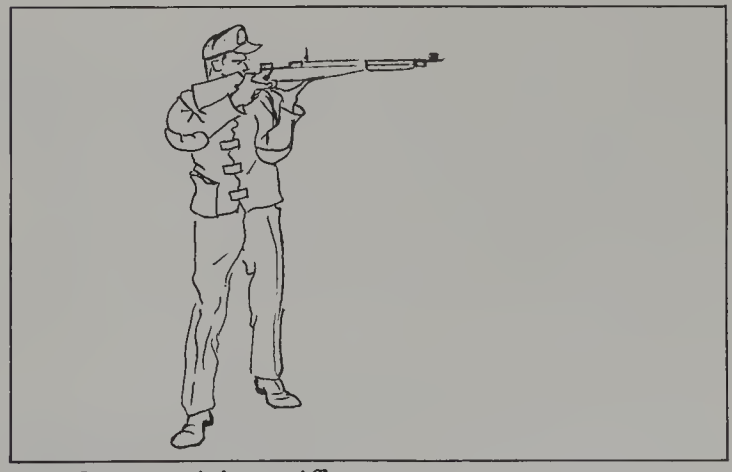
Standard nomenclature the official name by which items of military equipment are designated so that they may be identified without confusion.

Standard Nomenclature Lists are lists published by and for the U.S. military service setting forth the official names for odnance material to facilitate ordering of, and reference to, items and parts.

Standard trajectory the calculated path a projectile will follow through the air under given conditions of: projectile size, shape and weight, propellent charge, angle of fire, weather conditions. Firing tables are based upon standard trajectories.

Standing breech that part of the frame of a gun that bears on the head of a cartridge and supports it, found in revolvers and in blow forward and hinged frame arms. In revolvers it is that part of the frame immediately behind the cylinder.

Standing position, handgun as prescribed in U.S. Army and Air Force training, the shooter stands half-facing the target, feet spread 12 to 17" apart with body weight balanced on both feet, legs straight without stiffness, hips level, and the stance adjusted so firing arm points naturally at the target with a proper one hand grip of the handgun. Muscles of the arm should be firm but not rigid, wrist locked, elbow straight and locked, and recoil to be taken on shoulder joint which acts as a pivot. Also called offhand position.



standing position, rifle

Standing position-rifle one of the standard postures in firing a rifle. The shooter stands half faced to

the right, left elbow well under the rifle, left hand holding rifle in front of balance point, right elbow high and cheek close to stock. Also called "offhand" position.

Star semiautomatic pistols made in Spain for both military and civilian use and sold in the U.S.

Star class a mark or symbol once used by U.S. Government arsenals to signify a high standard of excellence. In range tests Springfield rifles that grouped exceptionally well were stamped with a small star and thereafter referred to as "star" class rifles.

Star crimp the end closure of a paper tube shotshell in which the tube is folded into five equal segments and compressed inwardly to cover the shot column. Modern plastic shot shells are made with six or eight segment folds treated in much the same manner as a star crimp.

Star gage an instrument that may be inserted in the bore of a gun to measure its diameter.

Starr the name of revolvers and carbines designed by Eben T. Starr of New York who, in 1856, received a patent on his first revolver design and in 1860 a second patent.

Station one of the stands or shooting positions, often called a peg or post, found in skeet and trap shooting.

Steel iron alloyed with carbon and certain other elements depending on intended use. Ordnance steel, for example, contained 0.45 to 0.55% of carbon, 1.00 to 1.30% manganese; max. 0.05% phosphorous; max. 0.05% sulphur. Prior to 1852, practically all small arms barrels in the United States were made of wrought iron or soft carbon steel in view of the relatively low breech pressures then obtained with black powder. With modern pressures of 38,000 to 50,000 psi and upwards, steels of higher tensile strength are commonly used.

star pistol

Steel coloring the normal color of a steel surface may be changed by treating the surface in various ways. In gunsmithing different shades of blue, black or brown are imparted to the surface of a barrel or gun part by bluing, browning or parkerizing. See "bluing," "cold blue," "hot blue," "browning," "niter bluing process."

Steel jacketed in describing a bullet, refers to one encased in an outer shell of mild steel. Use of steel as a bullet jacket is described under "full jacketed."

Steel surface hardening also called case hardening, is accomplished by one of three methods depending upon the composition of the steel and the use to which it is to be put, — carburizing, cyaniding or nitriding. The first is the one most commonly employed by gunsmiths. See "case harden."

Steel wool an abrasive made by shaving thin layers of steel from wire. The cutting characteristics vary with the size of the fiber.

Stereoscopic range finder a telescopic instrument that furnishes correct ranges when the target sighted-on appears at the same distance or depth as an image or crosshair marked on its lens. Also called stereo range finder.

Stevens a trademark applied to an assortment of firearms manufactured by the Savage Arms Corporation of Westfield, Massachusetts.

Stevens, Joshua (1814–1907) an American gunsmith and inventor, who after being employed by Samuel Colt for some years began manufacture under his own name. In 1864, he founded J. Stevens & Co., manufacturers of pistols and revolvers.

Steyr the name of a 9mm, 8 round semiautomatic pistol that was the official sidearm of Austria, Hungary and Romania from 1912 to 1918, and of other caliber semiautomatic pistols made for civilian use. Also site of the famous Steyr works, makers of the Mannlicher-Schoenauer rifle.

Stippling the practice of roughing a wood or metal surface with a sharply pointed instrument. The resultant random pattern provides a good gripping surface.

Stirrup as a part of some revolvers it is the latch that holds a tip up barrel in firing position. As a part of some automatic pistols it is a trigger with two rearward arms to equalize pressure on the sear when the trigger is squeezed.

Stock the rigid member of wood, plastic or other material in a rifle, carbine or shotgun to which the barrel assembly is attached and which provides a means for holding the weapon to the shoulder. In handguns the stocks form the "grip." See "skeleton stock."

Stock, benchrest a true heavyweight benchrest stock is not really a gun handle but a wooden gun platform. So many different shapes and sizes are found in the benchrest field that no one stock can be made to serve as a representative specimen. Nevertheless, most are big, square-cut and bulky. Because they are not intended for carrying afield, and because their weight is designed to aid in steadying the rifle for high precision match shooting, their bulk is well suited to their function.

Stock blank a rough cut piece of gunstock wood prior to shaping.

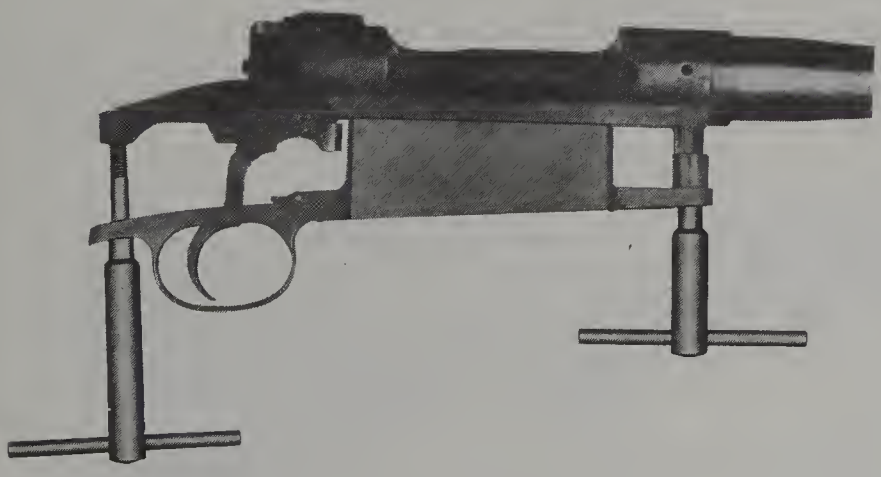
Stock, buttstock that portion of a two piece stock that forms the butt portion, i.e. the portion which is laid in contact with the shoulder.

Stock, English a type of shotgun stock noted for its slim lines and light weight. English shotgun stocks are made with a straight grip and a small, narrow forend.

Stock, free rifle a term used to describe those target rifle stocks that are used in "open" competition. In "free" rifle competition no restrictive limits are set for stock size, weight or shape. Most free rifle stocks are made with a thumbhole, high comb, hook plate, and adjustable palm rest.

Stock, full stock a type of rifle stock that extends to the muzzle of the weapon. In sporting rifles this style is often referred to as a "Mannlicher" stock.

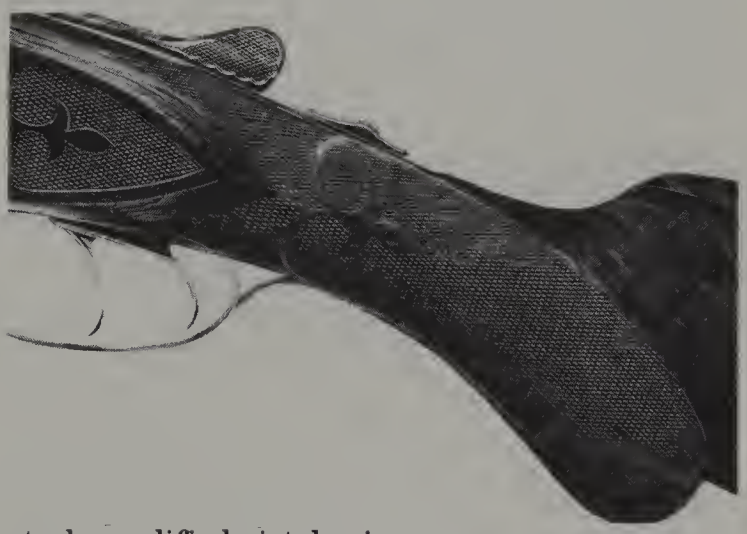
Stockmaker's screws the special, quickly removeable, pilot guard screws used by a stockmaker when



stockmaker's screws

inletting the stock for a bolt-action rifle.

Stock, Mannlicher a stock design popularized by the famous Mannlicher-Schoenauer rifles of the Austrian Steyr Works. The Mannlicher stock is characterized by the extension of the wooden forend to the muzzle of the gun.



stock, modified pistol grip

Stock, modified pistol grip a type of rifle or shotgun stock in which a small pistol grip is shaped in the form of a rounded knob.

Stock, nylon a stock for a rifle or shotgun made almost entirely of nylon.

Stock, one-piece a full length rifle or shotgun stock made from a single wood blank.

Stock, pistol grip a rifle or shotgun stock shaped with a simulated pistol grip for the trigger hand.

Stock pitch the distance between the tip of the muzzle of a shoulder arm and a line perpendicular to the surface upon which the butt end of the gun rests flat, when such line just touches the receiver. See illustration. Proper pitch is entirely dependent upon the physical characteristics of the shooter; too much pitch will cause him to shoot consistently low while not enough, will cause him to shoot high.

Stock, semifinished a stock maker's classification for a stock that is approximately 80% shaped and inletted.

Stock, straight grip a slim, straight line stock without pistol grip. On rifles or carbines this is often called a Western style stock. On shotguns, it is referred to as an English style stock.

Stock, 3/4 a term used to describe the length of a conventional rifle stock: that is, a stock whose forend reaches to a point under the barrel about mid-way between the receiver and the muzzle. (Used to differentiate from full length Mannlicher style stocks.)
The key to the Whelen pattern is an unobstrusive cheek-piece and comb sloping gently forward and down — a feature that tends to pull the stock away from the shooter's face as the rifle recoils.

Stock, thumbhole a target type stock, generally found on match rifles used in "free rifle" competition. This stock is made with an overly large butt section and is shaped with a very full pistol grip behind which is bored a hole to accommodate the thumb of the shooter's trigger hand. See "stock, free rifle."

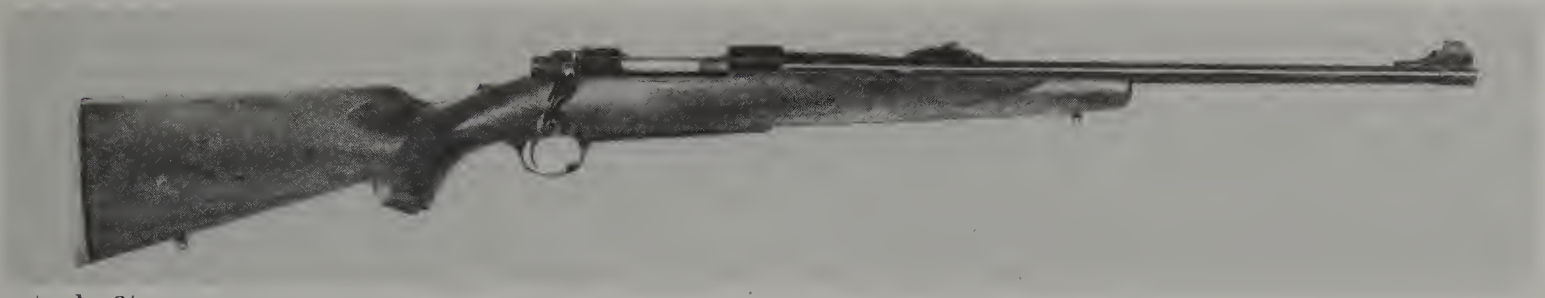
Stock, two piece the wooden buttstock and forend of a firearm made as two separate pieces.

Stock, Whelen a pattern of rifle stock developed and popularized by the late Colonel Townsend Whelen. The key to the Whelen pattern is an unobstrusive cheek-piece and comb sloping gently forward and down — a feature that tends to pull the stock away from the shooter's face as the rifle recoils.

Stone a piece of cemented earthy or mineral matter, certain kinds of which are important in the manufacture of firearms because of their abrasive properties. Natural stones usually employed for oilstones are the Washita and the Arkansas stones. While either oil or water may be used with those stones, another popular natural stone, the India, also called Hindustan, a coarse stone, is used only with water.

Stoner rifle (of Stoner system) a military rifle, caliber 5.56mm (.219 inches) gas operated, air cooled, fired either automatically or semi-automatically.

stock, semifinished



stock, 3/4

Magazine has 30 rounds capacity. One of six weapons having certain components basic to all, constituting a weapons system termed Stoner 63. Tested but not adopted as a U.S. military weapon.

Stoner 63 Weapons System a family of military weapons designed by Eugene M. Stoner, best known as the inventor of the AR-15 rifle (standardized by the U.S. Army as the M16). The system consists of six different weapons that are based on certain components common to all, namely a shoulder rifle with bipod, belt fed automatic rifle with bipod, a medium machine gun tripod mounted, and a fixed machine gun for vehicle mounting. All are in caliber 5.56mm. Tested by the U.S. Army it was not adopted as an official weapons system.

Stop a device that checks the movement of a part or prevents it from moving by locking it in place. The stop on a .45 caliber automatic pistol that holds the slide open after the last cartridge in the magazine has been fired, is an example.

Stoppage the unintended stopping of fire of a gun caused by faulty action of the gun or of the ammunition.

Stop watch a time piece usually calibrated to read to a tenth of a second, used in shooting events to measure the time consumed in rapid fire contests.

Straight (or straight run) common to skeet and trap shooting: means that a shooter has broken all of the targets in a particular event.

Straight-pull action a bolt action as in the Winchester, Lee and the Ross, in which the bolt is moved straight back and forward instead of "up, back, forward, down" as in the turnbolt Mauser action.

Strain screw a screw found in many revolvers, rifles and shotguns to hold and make adjustable, the tension of the mainspring.

Strap a flat, narrow band of leather, webbing or other flexible material. Also applies to any flat narrow strip of material used as a fastening. See "sling."

Stray something that has wandered away, such as a stray bullet — beyond its intended flight path.

Streamline bullet the British term for a boat-tail bullet.

Stress the force exerted upon a body tending to deform it. It is generally expressed in pounds per square inch. See "tensile strength."

Striae the markings left on the bearing surfaces of a fired bullet. An important means for identifying the firearm from which a bullet has been fired.

Striagraph a firearms identification contour-analyzing instrument which enables an operator to obtain a photographic chart or recording of the surface contours of a bullet or gun bore.

Strike of bullet another term for "point of impact" or "hit."

Striker a type of firing pin, rod-like, which travels inside the breechblock and when cocked is under tension of its own spiral spring. When released by action of the trigger it projects its integral or separable pin against the primer.

Striking plate the upright metal piece in a snaphaunce or flintlock against which a spark is produced by striking it with pyrites or flint. Properly called a "frizzen" or "batterie."

Striking power See "knockdown effect."

Striking velocity the speed of a projectile at the point of impact.

String the number of shots fired in a given stage of match competition; usually a "string" consists of five or ten shots.

Stripped action a bare rifle or shotgun receiver lacking related parts. The comparable part in a handgun is more properly referred to as a "frame."

Stripping the disassembling of a firearm, or, when used in referring to a bullet it is the loss of some of the metal of the bullet jacket due to failure of the bullet to properly engage the rifling.

Strut the component part of the firing mechansim of a gun that puts pressure on the hammer.

Stud a projection on a gun holding or engaging another part as, for example, a sight stud or a bayonet stud.

Stutzen translated means "short rifle." It was an Austrian service rifle with a 19 inch barrel length stemming from an 1890 carbine model.

Subcaliber a caliber smaller than standard for the gun on which practice is being given. Conversion units or adapters make possible the use of cartridges smaller than those for which a gun is designed.

Subcaliber equipment items used for firing subcaliber ammunition in practice with larger guns, such as adapters, tubes, small guns, and accessories.

Subcaliber firing practice firing with subcaliber ammunition to give training in the use of guns of larger calibers.

Subcaliber gun a gun mounted on the outside and above the barrel of a cannon used in practice firing of subcaliber ammunition as part of aiming drills with the larger guns.

Subcaliber range a firing range suitable for firing of subcaliber ammunition. Such a range may be equipped with miniature landscape targets and other devices to simulate the conditions under which the regular caliber ammunition would be used.

Subcaliber tube a tube that may be fitted into the bore of a gun and which permits the use of subcaliber ammunition in practice firing.

Submachine gun a lightweight automatic firearm gun designed to be fired from the shoulder or hip. Developed during World War II, they were generally air-cooled and blowback operated.

Sugarloaf bullet a bullet of conical shape having a flat nose. Also called a "picket" bullet.

Suicide special generally covers the multitude of cheap, poor quality pocket revolvers made in the United States during the last half of the 19th century. Apparently the term first came into use by collectors in 1948.

Sullivan Law the New York State firearms law known for its drastic regulatory feature governing the purchase, ownership and carrying of handguns. Enacted into law in 1911. Ironically, this law has done little or nothing to curb the unlawful use of firearms, judging from FBI statistics.

Sulphur a chemical element whose chemical symbol is "S" and which is readily found in many areas. It was combined with charcoal and potassium nitrate (saltpeter) to make the first gunpowder. It is also used in the manufacture of sulphuric acid.

Sulphur cast a cast of sulphur made of the chamber, bullet seat and bore of a firearm to accurately ascertain the dimensions of these somewhat inaccessible parts. The sulphur cast is made relatively nonshrinking by premixing powdered lamp black and gun camphor, dissolved in alcohol, with the sulphur.

Sulphuric acid whose chemical symbol is H_2SO_4 is a colorless, oily liquid, sometimes called oil of vitriol; used in the production of explosives and the cleaning of metal surfaces.

Summit of trajectory the highest point that a projectile reaches in its flight from the gun to the target.

Superelevation the amount that the axis of the bore of a gun must be pointed above the line joining the gun and the target to allow for the curved path of the projectile in fight.

Super Speed the trade name employed by Winchester-Western for certain cartridges made by that firm.

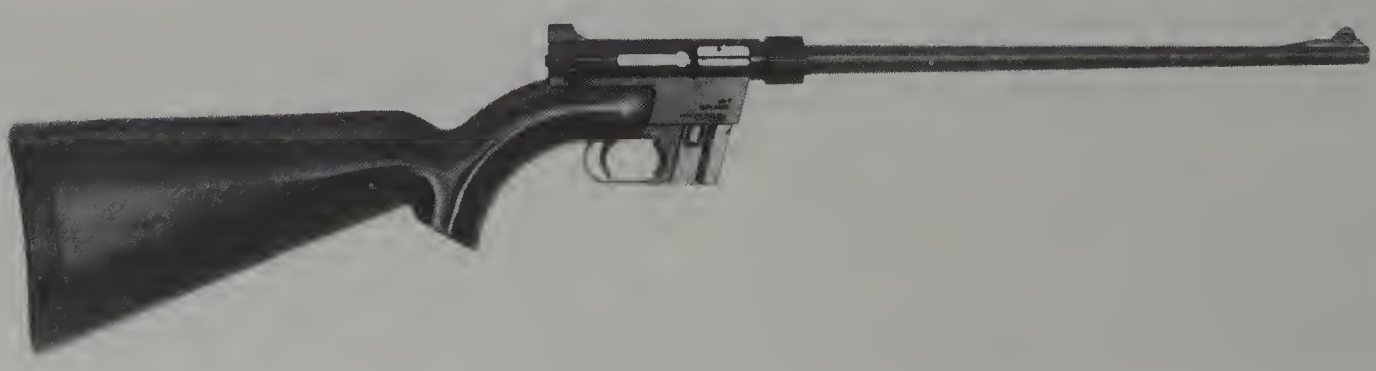
Super-X trade name of the Western Cartridge Company for cartridges made by it.

Sureshot a common expression for a proficient shooter.

Surveillance with respect to ammunition is the programmed inspection, testing and maintenance that insures its storage in usable condition.

Survival gun a firearm, usually of small caliber, designed expressly for survival purposes and carried in planes or ships travelling remote areas.

Sustaining lead (LEED) tracking a moving target by keeping the sights moving at the same relative speed as the target and maintaining that lead until the gun is fired.



survival gun

survival gun

Swab a long handled brush used for cleaning the bore of a gun, usually of cannon size.

Swage usually applies to a number of different kinds of tools having hollow impressions in their faces for finishing round work and consisting of pairs of dies with matching tops and bottoms.

Swaged choke a choke formed during manufacture, after the finish ream of the barrel to a true cylinder, by acting on the exterior of the barrel to push material inward at the muzzle and thereafter reaming to the desired dimension.

Swaging, bullet See bullet swaging."

Sweating 1. a method of soldering two metal parts together by heating them sufficiently to melt and draw the solder, instead of using a soldering iron. 2. in the case of firearms the word applied to the condensation of moisture from the air on metallic surfaces, under certain circumstances.

Swedging better known as "swaging."

swing mount

Swing mount a hinged scope mount (patented by Pachmayr Gun Works) that enables the shooter to swivel the scope out of the way to permit use of the rifle's iron sights. A form of scope mount that is especially well suited for rifles that are intended for use on dangerous game.

Swing-out cylinder the cylinder of a revolver that is mounted on a crane or yoke and which swings clear of the frame for loading. When latched in the frame the cylinder is rigidly held ready for firing.

Swing-through leading a method of giving lateral direction to a fired projectile by swinging the muzzle of the gun in the direction the target is moving. Its effect is relatively small, the lead being the important factor in causing a projectile to meet a moving target crossing in front of a shooter.

swivel

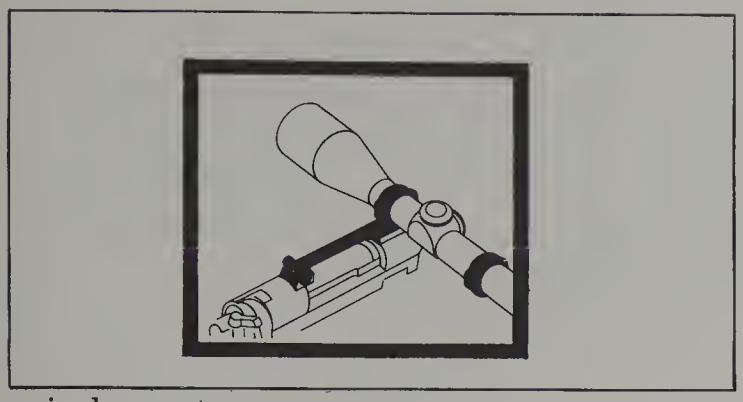
Swivel a link or coupling piece that permits the joined parts freedom of rotation independent of each other. For example sling swivels, a stacking swivel, or swivel ramrod.

Swivel bow that portion of a swivel which forms the loop through which a sling or carrying strap is threaded.

Swivel gun a gun so mounted that it may be turned from side to side or up and down.

Swivel hook an English style swivel having a hooked end adapted to be readily snapped into eyes or bases protruding from the underside of a firearm, to permit quick attachment and detachment.

swivel gun



swivel mount

Swivel mount a type of scope mounting arrangement that employs a semi-round stud under the forward ring and which is fastened to the baseplate by inserting the stud at right angles to the line of sight and swivelling the scope 90° to seat the rear base between two opposing, windage-adjusting, screws.

Sword bar the British term for a bayonet lug.

Synchronism the concurrence of events in time as typified in the early days of military aircraft when machine guns had to be synchronized with propeller rotation so that bullets could pass between the blades of the revolving propeller.

T

Tail gun the flexibly mounted gun in the tail of an aircraft.

Tail wind a wind blowing from behind the shooter when he is facing the target, or a game target, such as a duck or goose, flying with the wind and thus moving at an unusual speed.

Take down to take a gun apart, that is, to disassemble it. Also called "stripping."

Talc a mineral known as steatite or soapstone, a soft, greasy white or gray substance. It has been experimented with as a lubricant. Chemically known as hydrated magnesium silicate.

Tampion, tompion a stopper, such as a wooden plug, or a cover, especially for the muzzle of a gun to protect the bore when not in use.

Tang a projecting prong, tongue or the like, usually forming part of one piece for joining it to another piece, as, for example, a trigger guard having a projection at each end for screwing it to the stock. Most commonly used in the firearms industry to describe the top rearmost extension of a receiver at a point where it joins the stock.

tang safety

Tang safety a safety device mounted in the tang area of a firearm and especially common to side-by-side and over and under shotguns.

Tang sight an aperture type rear sight, usually adjustable for elevation, that is anchored on the tang of a firearm. This type of sight is used on rifles or carbines that do not lend themselves to standard side mounted receiver sights due to top ejection or mechanical complications.

Tank gun any form of artillery piece mounted in the turret of a tank, although tanks are also equipped with one or more machine guns.

Tannenberg gun an ancient 13 inch bronze casting, part of a firearm, found in the ruins of Castle Tannenberg and now in a museum in Nuremberg, Germany. It is known to have predated 1399.

Tap an internal thread cutting tool having teeth to shape the thread. There are a number of classifications for taps according to their use.

Tapelock an advance in the pill lock consisting of a strip of paper or fabric into which was fitted a string of percussion pellets; these were fed into firing position by the action of the lock. The earliest form of percussion primer.

Tape primer a row of percussion pellets enclosed between two strips of paper and in rolled up form used in a gun, such as "paper caps" are used in toy guns today.

Taper pin a pin used to secure two parts together, usually with a pressure or friction fit.

Tarage table used as a reference to determine the pressure exerted in shortening a crusher cylinder as used in a pressure gage. It is prepared by statically crushing standard cylinders and determining by

measure the amount of shortening for various applied pressures. Measuring the amount of shortening of a cylinder used in a pressure gage and finding the same distance in the table will give the amount of pressure to which it was subjected. See "pressure gage."

Target a specific point, area, object or group of objects at which fire is directed, either in practice, hunting or match competition, or under combat conditions.

Target area the area in which a target is placed and which is subject to fire.

Target butt a wall on a target range having the target pit on one side and an earthen cover on the other to protect target pit personnel. Also simply called a "butt."

Target course the path of a moving target.

Target frame a frame employed as a mounting for paper targets used in target practice.

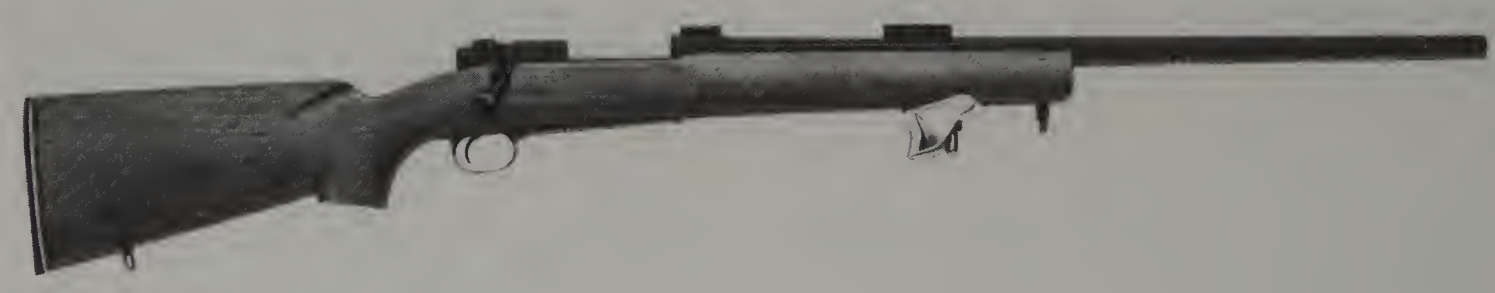
Target hammer a wide spur hammer frequently employed on target revolvers to facilitate gripping.

Target, NRA one of a series of targets officially adopted as standard targets by the National Rifle Association.

Target pit a trench in front of a row of targets within which personnel may find security from fire and from which position they may replace or mark targets for the benefit of the shooters.

Target practice any exercise in aiming and firing at a practice target.

Target range an area set aside and equipped for shooting at targets. Also simply called "range."



target rifle

Target rifle a rifle designed expressly for competitive target shooting.

Target sled a target-carrying sled that is drawn or towed to provide a moving target for target practice.

Target trigger a trigger having a wider than normal frontal plane, designed to provide a large engaging surface for the trigger finger. When properly fitted a target trigger is adjusted to eliminate or minimize travel and to function with a crisp, light let-off.

Taxidermy the art of preparing animal skins, then stuffing and mounting them in lifelike form.

Teat fire a front loading cartridge invented in 1864, which had a rearwardly extending teat containing fulminate that was crushed by the fall of a chisel-nosed hammer.

Teflon the registered trademark of E.I. duPont de Nemours & Co. for a group of synthetic resins based on tetrafluoroethylene polymers. A formulation known as Teflon-S has been used as a protective finish for gun barrels and parts.

Telescope an optical instrument that magnifies distant images in order to facilitate their viewing by the human eye. The quality of a telescope is determined by its design and construction. Four optical factors involved are illumination, definition (resolving power), size of field, and magnifying power.

Telescope mount a base or holder for a telescope, such as a bracket for securing a telescope to a gun.

Telescopic sight a refracting telescope, mounted securely to the firearm, and equipped with a reticle designed to serve as an aiming device. There are several different types of scope sights (as they are commonly called) and, in addition to the choice of features they offer such as magnification, reticle, and adjusting devices, they are primarily selected for the length of eye-relief they provide. For example: short eye-relief scopes (having an eye-relief of approximately two inches) are designed expressly for .22 rimfire firearms and can only be used safely on that small caliber. Such scopes are generally made with 3/4-inch diameter tubes. Severe eye damage could result if a rimfire scope were employed on a higher-recoiling centerfire rifle. Next are found the scopes intended for the small to intermediate centerfire rifles made with tubes measuring one inch to 26 millimeters in di-

telescope

ameter. Eye relief ranges from 3½ inches to 4 inches to provide a reasonable margin of safety between the eye and the eyepiece of the scope. Scopes in this class can be mounted on calibers up to 30/06 and on shotguns up to 12 gauge. Scopes intended for high-recoiling magnums are also made on one-inch or 26mm tubes but have eye reliefs exceeding 4 inches, often closer to 5. Finally, there are a number of scopes designed to offer exceptionally long eye relief: these are designed for top-ejecting rifles as well as handguns and recoil is not a factor in their application. When equipping a firearm with a scope sight it is important that it is mounted securely and that it is focused properly for the individual shooter. When firing a scope equipped firearm, the shooter must be careful to shoulder the butt securely and to maintain proper eye relief while aiming and shooting. Whenever the image area appears to develop a heavy black outer ring, it is an indication that the shooter is "crawling the stock" by positioning his eye too close to the eyepiece.

Temperature the degree of heat or cold measured by a specified scale and, with respect to firearms and ammunition, unless stated to the contrary, 70° Fahrenheit is the normal temperature at which velocities, pressures and trajectories are measured. Variation in the temperature of ammunition will effect pressure and velocity. A change of temperature of 10 degrees Fahrenheit could mean a change in muzzle velocity, depending on the ammunition, of 17 feet per second.

Tempering sometimes called "drawing" is the method used to reduce the brittleness in hardened steel and relieve the internal stresses caused by the sudden cooling in the quenching bath. The steel is reheated to a specific temperature and control-cooled by means of a time-and-temperature process.

Tenite the registered trademark for thermoplastic materials used for making wood-simulated gun stocks.

Tenon a projecting part adapted to fit into a mortise, thus forming a joint.

Tensile strength the resistance offered by a material to stress that tends to pull it apart. The stress is usually expressed in pounds per square inch. Prior to reaching the breaking point the yield point is reached, and so to properly express the breaking point it is referred to as the ultimate tensile strength. Some appropriate figures are in psi:

	Yield Point	Ultimate Tensile Strength
lead, cast	1780	
rolled	3000	
brass,		45,000
cartridge	20,000	
aluminum,		46,000
cast	36,000	
wrought	31,000	51,000
iron		
silicon steel	52,000	72,000
chrome steel	76,000	103,200
chrome moly	189,000	205,000

Terminal ballistics is the study of the effect of projectiles upon the target, such as penetration and shocking power.

Terminal velocity the remaining velocity or speed of a projectile at the point in its downward path where it is level with the muzzle of the gun. See "remaining velocity," "striking velocity."

Testing target a special target, used to boresight an artillery piece. It has two marks separated by the same distance that separates the axis of the bore and the axis of the sight, so that the gun barrel may be pointed at one mark and the sight brought to bear on the other.

Test piece a term used in connection with artillery usage: a gun selected to be tested for calibration by comparison with a reference piece.

Test, proof See "proof test."

Tetryl (TET rill) a sensitive explosive used especially in caps and bursters to detonate less sensitive explosives.

Texas Colt a gun collector's term for the first Colt re-

volvers produced by Colt's Patent Fire Arms Manufacturing Company, at Paterson, New Jersey, by reason of their popularity in Texas.

Thermometer an instrument for measuring relatively low temperatures, usually not over 200 or 300 degrees F. The scales in common use for thermometers are the Fahrenheit (F) in English speaking countries and the Centigrade (C) in continental countries and in scientific fields.

Thimbles tube-like devices set into the forestock of a muzzleloading arm for the purpose of holding the ramrod; usually made from brass.

Thirty-0-six the common designation of the U.S. rifle cartridge used in both World Wars which officially is the caliber .30 M 1906. It has a rimless case about 2½" long. In figures it is abbreviated to .30-06.

Thirty-thirty the common designation for a relatively small size sporting cartridge having a rimmed base and being about two inches long, brought out in 1895 by the Winchester Repeating Arms Company. The designation is derived from the diameter of the rifle bore and the original 30 grains weight of powder charge. Similarity with the "thirty-0-six" lies only in their identical bullet diameter. The powder charge of the 30-06 is about 50 grains. See "thirty-0-six."

Thompson, John Taliaferro (1860-1940) A Brigadier General of the Ordnance Department, U.S. Army, who designed a sub-machine gun that was first marketed in 1921 and which became popularly known as a tommy gun.

Thompson submachine gun a .45 caliber, air-cooled automatic weapon that can be carried and operated by one man.

Threaded breechblock . an early type that unscrewed to open the breech. The breechloader invented by Major Patrick Ferguson of the British Army in 1776 contained one that was threaded into a vertical hole that passed entirely through the gun. At its lower end the screw was attached to the trigger guard. By turning the trigger guard counterclockwise the breechblock was lowered to expose the chamber for loading.

Threaded hood the British term for a receiver ring.

Thread gage a tool designed to measure the size and pitch of screw threads.

Throat the tapered portion of the bore forward of the chamber where it diminishes in cross section to meet the rifling. In a revolver it is the enlargement of the bore at the breech to facilitate the centering of the bullet in the barrel when it jumps from the cylinder into the bore. Also may be referred to as "leade." "Jumping the throat" is an expression used to describe the initial motion of a bullet upon being fired. The throat is the area through which the bullet first moves as it starts to leave the case and before it engages the rifling. See "leade."

thumbhole stock

Thumbhole stock a target rifle stock having a hole through it to accommodate the thumb of the firing hand to provide means for relaxing the hand and thus increasing its sensitivity to the trigger pull. See "stock, thumbhole."

Thumb piece a latch on certain revolvers, that when pushed forward releases the cylinder.

Thumb rest a shelf or depression shaped into the gripping surface of a handgun or rifle to provide a resting platform for the shooter's trigger-hand thumb.

Thumb trigger rifle a rifle having a thumb piece projecting up through the stock tang (behind the action) that discharges the rifle instead of a coventional trigger. Pressing down on the thumb piece disengages the sear from its recess in the firing pin. Rifles so made in past years dispensed with the trigger and the trigger guard. This means of firing a rifle was believed to permit more accurate firing.

Tige (TEE sh) in an early rifle, a steel pin in the breech against which the ball was hammered by the ramrod to expand it to fit the grooves. The propellent charge was placed around the tige.

Timed fire a rate of fire practiced in target shooting which somewhat restricts the shooter in the time he is allowed to complete a prescribed course. For example, in timed fire handgun competition the shooter is generally allowed four seconds per shot, completing a five shot string in twenty seconds.

Time lag the interval of time that elapses between the action of one part of a mechanism and the action or reaction of a connected part.

Time of fall of a bullet in air is dependent upon the force of gravity acting upon it as with any freely falling body and the resistance of the air to its passage through it.

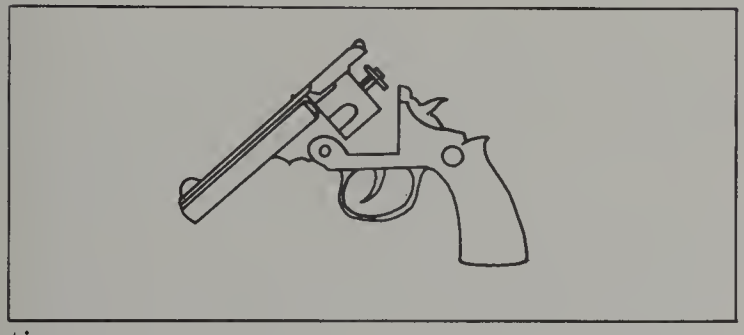
Time of flight the elapsed time, in seconds, from the instant a projectile leaves the muzzle of a gun until the instant it strikes or bursts.

Tin is a soft, ductile and malleable lustrous white metal element whose chemical symbol is Sn. It has a relatively low melting point and is extensively used as an alloy with other metals and in tin plating of other metals. In the firearms art its use in bronzes, solders and babbitt metals is best known; however, it is also used extensively in bullet making. "Pewter" is a term for almost pure tin.

Tinder box a metal container used to hold tinder, flint and steel for starting a fire.

Tinder lighter similar to the lock on a flintlock gun having instead of a barrel, a metal receptacle for holding an inflammable substance to catch the sparks. Used before the advent of friction matches.

Tipping the spiralling of a bullet in its flight through the air. Also called "air spiral" or "wabble."



tip up

Tip up a colloquial expression referring to a top-breaking revolver.

TNT the abbreviation for the high explosives, trinitrotoluene and trinitrotoluol.

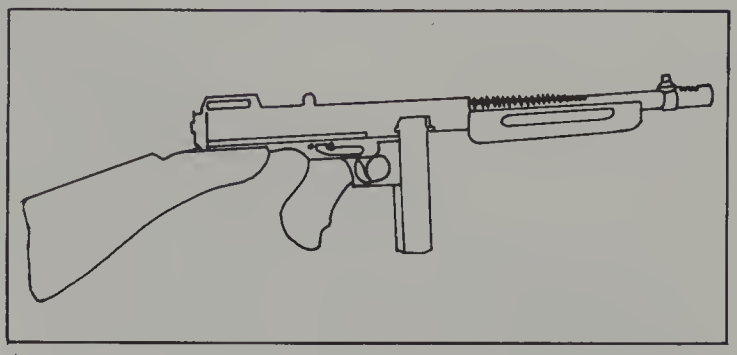
Toe the bottom part of the butt of a rifle or shotgun.

Toggle joint a joint formed by joining two members with a pin or the like to permit the members to be pivoted about it so that movement of the joint will either bring the free ends together or straighten them out. The Luger pistol is an example of use of such a joint in a firearm. See "Luger."

Tokarev a 7.62mm, 8 shot semi-automatic pistol, an official military weapon of Russia beginning in 1930 and used as such by various other countries allied with Russia.

Tolerance the allowable deviation from a standard dimension of a part or from the accuracy of an instrument. By keeping within prescribed tolerances the weapons and ammunition will function as intended.

Toluol, toluene toluol is the common name for the chemical toluene, a flammable liquid obtained



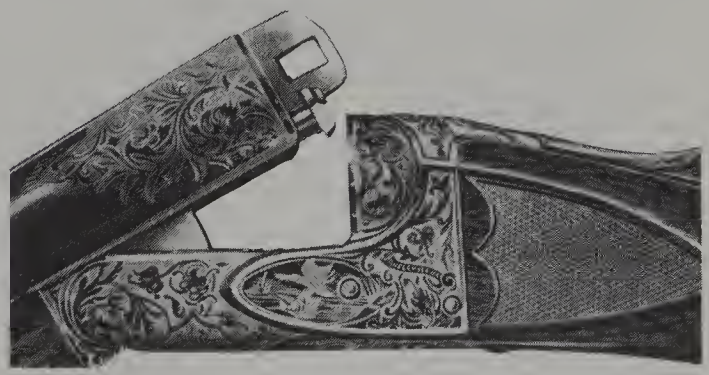
tommy gun

Tommy gun the popular name for a submachine gun designed by Brig. Gen. John T. Thompson. It was the first American submachine gun, making its appearance in 1921. The military arm, the caliber .45 M 1928 A1 Submachine Gun has a 20 round box magazine, a 50 round drum magazine, and at one time a 100 round drum magazine. It uses a blow-back system and has a cyclic rate of from 600 to 700 rounds per minute.

Tompion, tampion a stopper such as a wooden plug, or cover, especially for the muzzle of a gun to protect the bore when not in use.

Top break a form of revolver design popular during the early 1900's. Instead of the swing-out cylinder which is commonly used today, the top-break revolver was made with a hinge located in front of the cylinder where the barrel joined the frame. A spring lock was positioned at the rear of the top strap, above the firing pin port. When the lock was opened the hinge would permit the barrel to tip down at the muzzle and this would raise the cylinder, exposing the chambers for unloading or loading.

Top extension (sometimes called barrel extension) common to double barrel shotguns and some over & under guns. An extension that protrudes from the



top extension

top lever

chamber area of the barrels and which fits into a corresponding recess in the face of the breech. When a cross-bolt is employed in the receiver mechanism, the sliding bolt passes through a hole cut into the barrel extension and serves to lock the barrels securely to the breech.

Top lever the locking lever common to break-open type guns, such as side by side or over & under double barrel shotguns.

Top mount a form of scope mount that is fastened directly on top of the action so that the axis of the scope is aligned directly over the axis of the bore.

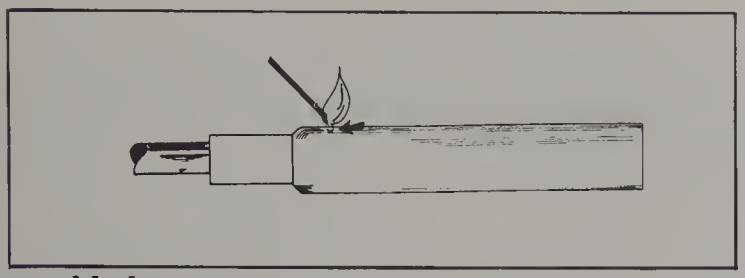
Torque an effect noticeable in lightweight rifles firing high velocity cartridges, the rifle tending to rotate in a direction opposite to the rotation of the bullet passing through the bore.

Touch box a case or small counterpart of the powder flask used to hold the priming powder for matchlocks, wheellocks, and flintlocks. Since the powder was finer than that for the charge, and used to prime the gun, the touch box was called a primer.

Touche a small torch, faggot or piece of wire which

top mount

when lit or heated to red heat, was placed by a cannoneer to the touch hole of an early cannon to ignite the powder charge.



touchhole

Touchhole the opening in early firearms that provided communication between the priming composition outside the barrel and the powder charge within the barrel which permitted the flash of the priming mixture to ignite the powder.

Touch pan the flash pan of early firearms. See "pan."

Trace path of a tracer bullet.

Tracer 1. a burning composition placed in ammunition to show the path of the projectile. 2. a type of ammunition used for observation fire, signaling and incendiary purposes.

Tracer ammunition See "tracer."

Tracer bullet a bullet containing a chemical composition that burns in flight thus making its path visible to an observer. Also called "tracer." Such bullets may also be militarily employed as incendiaries.

Tracer stream the path of a series of tracer bullets.

Track to coordinate the movement of a gun with the speed and direction of a moving target.

Trade guns a term applied to flintlocks used in trade with the natives of Africa and the Americas. Sometimes inferior in quality, sometimes specially made for the trade. They were in the hands of Indians the first half of the 17th century.

Trademark a name, letter, symbol, device, mark or combination of them used in business to distinguish the goods or services of one manufacturer or seller from the goods or services of another. Under certain conditions prescribed by law, a trademark may be registered in the United States and foreign countries and be entitled to protection under the law. Frequently trademarks are incorrectly used by persons to name goods without regard to the fact that many manufacturers and sellers make and sell similar goods under their respective registered trademarks. The name "Vaseline", for example, is the registered trademark of the Chesebrough Manufacturing Company for their specific product, yet many erroneously refer to any petroleum jelly product as "Vaseline."

Trade name the name under which a person, firm or corporation does business. A trade name identifies and distinguishes a business; a trademark identifies and distinguishes a product. Manufacturers use their names as trademarks as well as trade names. In the firearms trade, even though the manufacturer does not put its name to such dual use, the public frequently treats the name as though it was a trademark.

Train to bring a weapon to bear upon a target. The word also describes a line of explosive to carry fire to a charge, usually called explosive train or powder train.

Trajectory (tra JECK toe ree) a chart, consisting of numerical measurements taken from the line of sight, or patterns traced on a graph, to indicate flight characteristics of projectiles fired under prescribed conditions at various elevations. Flight characteristics vary greatly from one gun to another and are further influenced by variations in powder charge, bullet weight, etc.

Trap the name applied to mechanically or electrically operated target throwers used in skeet and trapshooting. The name appears to have originated with the box or "trap" from which live birds were released when, about 1850, the sport originated in England with birds as targets.

"Trap & Field" official magazine of the Amateur Trapshooting Association, published monthly, with editorial and business offices located at 110 Waterway Boulevard, Indianapolis, Indiana.

Trapboy the person who places a clay target on a target-throwing machine, or one who loads an autofeeding machine with a number of targets.

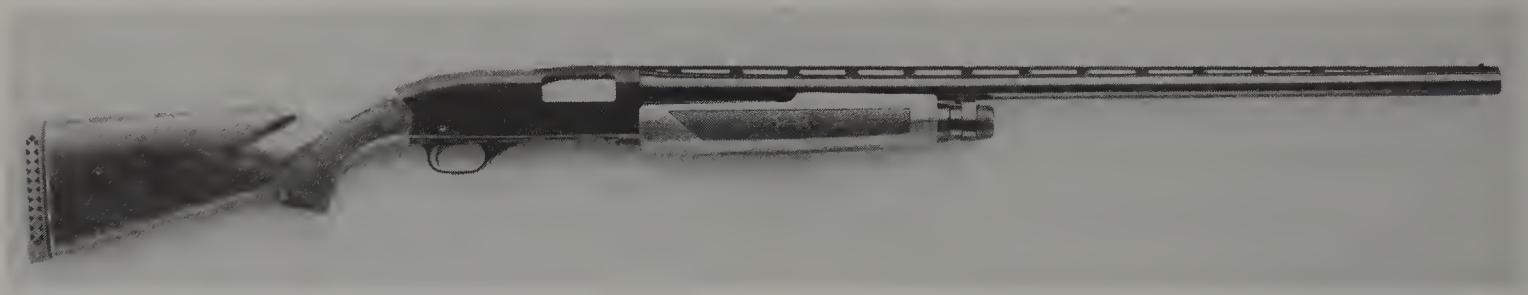
Trapdoor a name sometimes used by gun collectors in referring to the U.S. Springfield single-shot rifle that has a breechblock that pivots open like a trapdoor.

Trap door buttplate a buttplate for a rifle or shotgun designed with a hinged center plate which, when opened, exposes a compartment cut inside the butt of the stock. This compartment is used for storing cleaning equipment, spare parts, or extra rounds of ammunition.

Trap, electrical an electrically operated target-throwing trap as used in the sports of skeet and trap shooting.

Trap field a field upon which trapshooting competitions are held; field consists of a single trap house containing one target throwing device (trap). The trap house is positioned so that its target throwing trap is 16 yards from the nearest row of shooting stations. Shooting stations are arranged in rows of five to accommodate five competitors per round. For handicap

purposes shooters are penalized in yardage, and for that reason rows of shooting stations are spaced at one yard intervals from 16 to 27 yards.



trap gun

Trap gun 1. a gun of the type patented in 1857 by F. Reuthe having in addition to the gun barrels a spring mechanism for discharging a spear that would supposedly hurl bait a distance away and so serve to lure animals into shooting range. The term is sometimes applied to spring guns. 2. a shotgun made for the sport of trapshooting. Trap guns are exclusively 12 gauge and are made with barrels measuring 30 inches or more. Barrels are usually bored with a full choke although some shooters prefer a slightly more open boring (such as improved-modified) for 16-yard competition. Stocks are generally made with a high comb measuring about 1⅜ inches drop at comb and 1¾ inches drop at heel. Length of pull frequently exceeds 14¼ inches. Most trap guns have high ventilated ribs equipped with front and middle bead sights.

Trap gun, trip gun a gun so equipped with a trigger actuating device such as a wire, electric eye, etc., that it will fire when a man or animal trips it.

Trap house a protective structure from which targets may be hurled for trap or skeet shooting. See "skeet."

Trap, mechanical a mechanical target throwing device that is manually operated.

Trapshooter a shooter who engages in the sport of trapshooting, i.e., shooting at flying clay targets thrown from a trap.

Trapshooting a sport originating about 1850 in England, using live birds released from a box or trap to present a flying target to the shooter. Today, in the U.S., the sport of trapshooting is regulated by the Amateur Trapshooting Association and targets are clay discs hurled into the air by a trap.

Trapshooting Association See "Amateur Trapshooting Association."

Traverse to move a gun to the right or to the left on its mount. The amount of traverse is expressed as an angle.

Trigger that part of the lock (ignition system) pulled or squeezed by the finger to release the cock or hammer and fire the piece.

trap, mechanical

Trigger bar a connecting bar in some semiautomatic pistols that transmits the pressure on the trigger to the sear. At times also used with the double action unit of a semiautomatic pistol.

Trigger creep the slack or distance a trigger may be moved before it meets the resistance of the sear.

Trigger, double pull a firing mechanism that functions with a two stage mechanical movement distinctively felt by pulling or by squeezing the trigger and that provides an additional factor of safety.

Trigger, double set See "double set trigger."

Trigger finger any finger customarily used to squeeze the trigger of a gun, usually the forefinger of either hand.

Trigger, forward set a form of single "set" trigger; one that provides a conventional weight of pull if released in the normal manner, but which can be set for an exceptionally light pull through the forward movement of the trigger before normal rearward motion is commenced.

Trigger grooves the grooves or serrations cut into the face of a trigger to provide a non-slipping surface for the trigger finger.

Trigger guard the metal strap that partly surrounds the trigger and serves as a protecting member.

Trigger happy a colloquial expression for one, who without regard to circumstances or consequences fires a gun. It also applies to a person who acts in other matters in the same thoughtless manner.

Trigger, hinged (or folding) a feature sometimes found in double trigger mechanisms of better grade double barrel guns. The forward trigger is hinged to fold forward when pressure is exerted upon its rear surface. This feature serves to prevent bruising of the trigger finger under the recoil of the gun when the rear trigger is used. Especially desirable in firearms of large gauge or caliber.

Trigger lock an auxiliary locking device that anchors the trigger within the trigger guard. Frequently employed by gun owners when storing guns.

Triggerman a colloquial name for a hired gunman usually a gangster who commits murder with a gun, or one of a gang of law-breakers who shoots someone in the act of committing a crime.

Trigger, military a military trigger is essentially a two stage trigger with extra long travel in both stages. See "trigger, double pull."

Trigger, non-selective single a single trigger mechanism, such as that employed in a double barrel gun, designed to fire both barrels in unvarying sequence, i.e., the same barrel will always fire first upon the initial action of trigger and the second barrel will follow subsequent trigger action. The firing order cannot be reversed. See "trigger, selective single."

Trigger, offset See "offset trigger."

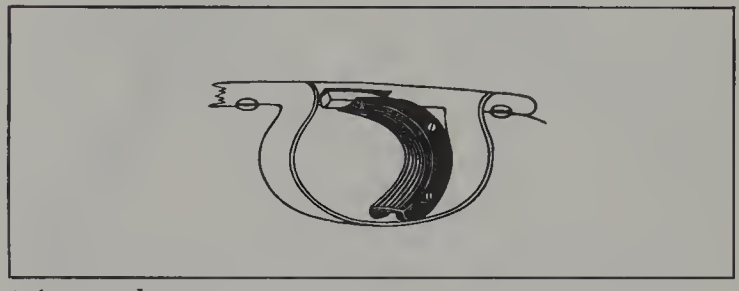
Trigger plate that portion of the lock mechanism through which the trigger enters the piece.

Trigger pull the resistance offered by a trigger when pressure is put upon it. The force to overcome this is expressed in pounds. The average desirable trigger pull for rifles and shotguns lies between 3 to 6 pounds. Target guns are generally set for lighter pulls when the rules permit, and handguns, particularly when used for target shooting, are adjusted for extremely light pulling weights.

Trigger, release a most unusual and widely frowned upon trigger mechanism occasionally found in target grade shotguns. Unlike the conventional trigger which fires a gun upon being pulled rearward, the release trigger fires upon being *released,* as it starts its forward, return motion.

Trigger, selective single a single trigger mechanism found in double barrel firearms which permits the user to select the barrel he wishes to fire first. The opposite barrel will automatically follow upon a second pull of the trigger. A selector is most often designed as part of the safety mechanism, or, at times, located near the trigger in the form of a lever.

Trigger shoe an adapter made to fit over a conventional trigger for the purpose of enlarging the trigger gripping surface. Common to target rifles and handguns.



trigger shoe

Trigger, single stage a trigger that offers little or no perceptible movement prior to release and firing.

Trigger squeeze one method of firing a small arm. The whole hand is contracted to put a gradual pressure or squeeze upon the trigger.

Trigger stop an adjustable stop to arrest the travel of a trigger almost at the instant of sear release. See "overtravel."

Trigger, target an easily adjustable single stage trigger mechanism designed to provide a pull and let-off that is light and crisp, with a minimum of travel.

Trigger, two stage See "trigger, double pull."

Trinitrotoluene, trinitrotoluol commonly known as TNT. Made by the nitration of toluene, i.e., by treating toluene with a mixture of nitric and sulphric acids. Has powerful, brisant explosive properties. Known as early as 1863, suggested as an explosive in 1890 and important militarily since 1904. The term "trinitrotoluol" is less correct chemically than "trinitrotoluene", but is also used as a name for the explosive.

Trip to release some part of a device that is being restrained . In some firearms the part of the action released by the trigger is called a trip.

tripod

Tripod a three-legged support or mount for a gun or an instrument. A bipod is a two-legged support.

Trombone action another name for slide or pump action.

Troy weight is a system of weights used for weighing gold, silver and other precious metals. One troy ounce is equal to 1.0971 avoirdupois ounces.

Truncated cone bullet a bullet whose shape is characterized by its cylindrical body and truncated cone nose portion, i.e., from its maximum diameter it slopes to a flat end.

Truncated hollow point bullet a lead core of truncated cone shaped nose portion encased in a jacket of harder metal except for its nose and base. A cavity is formed in the exposed nose of the lead core. The purpose of this construction is to give maximum expansion on impact.

Trunnion a supporting pivot for holding a gun or instrument on its mount permitting its elevation. A piece of artillery is supported by two pivots on its carriage.

Try gun a shoulder gun used to custom fit a shooter by ascertaining the stock measurements best suited to him. It is generally adjustable for length of pull, drop at heel and comb, pitch and cast.

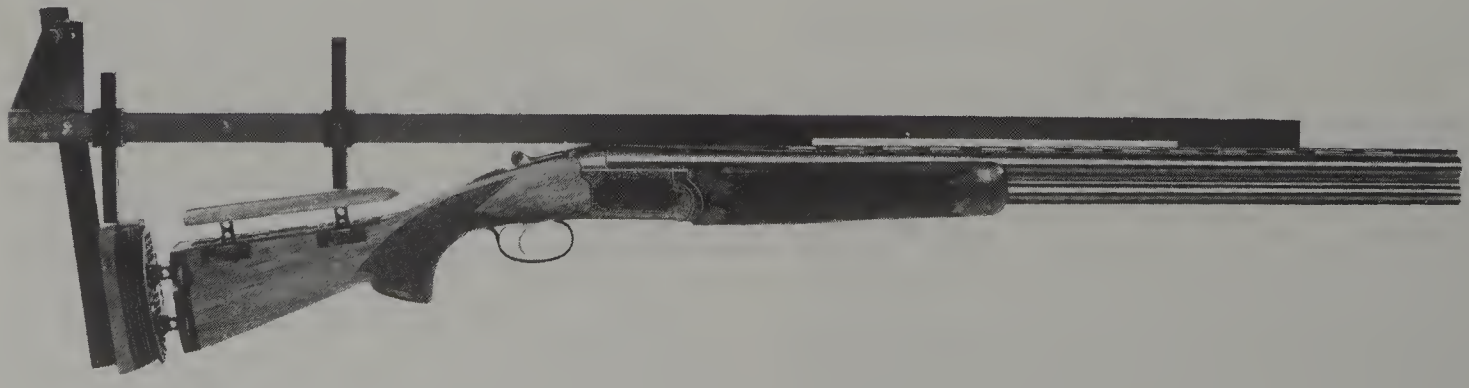
Tube the hollow cylinder containing the bore of a gun. "Tube" is generally a term used with artillery, while "barrel" is used with small arms.

Tube lock an ignition system employing a hollow copper tube about 5/8" long with an outside diameter of 1/16", filled with fulminate, inserted in the vent of a muzzleloader. Crushed between an anvil and the hammer it ignited the propellent charge. Patented 1818 by Joseph Manton.

Tubular magazine a magazine common to both rifles and shotguns (usually located under the barrel though occasionally contained in the buttstock). Tubular in form and designed to store cartridges end-to-end. Common to slide action and automatic shotguns as well as lever action rifles. Also found in many varieties of .22 caliber rifles.

Tumble the term used to describe a projectile that turns end over end in flight. It is not a sought after result.

Tunnel mount a scope mount designed to permit use of iron sights through tunnelled portions of the base and/or ring assemblies.



try gun

tunnel mount

Turkey shoot formerly a hunt for turkeys with firearms or a shoot using a live turkey as a target. Today a target shooting match with turkeys as prizes.

Turnbolt action a bolt action that requires the bolt to be turned, i.e., lifted up, to unlock its lugs from recesses in the receiver before it can be drawn back. To relock it the reverse motion is required.

Turpentine an oleoresin obtained from various coniferous trees, insoluable in water and having a distinctive odor and taste. Used with raw linseed oil to make a mixture found effective as an initial base coat in gunstock finishing.

Turret 1. that portion of a riflescope into which is fitted the adjusting device for windage and/or elevation. 2. the rotatable cannon housing of a tank.

Turret gun 1. a rifle or revolver using a cylinder resembling the turret of a battleship to hold the cartridges. The turret was mounted vertically or horizontally depending upon the particular type. Invented by John W. Cochran. Sometimes called Monitor after the Civil War vessel whose turret gave some resemblance. 2. a cannon mounted in the turret of a warship or in the turret of a military tank.

Twist in a rifled bore, the helical form of the lands and grooves between breech and muzzle. See "pitch."

Twist barrel See "Damascus barrel."

Two-piece mount a riflescope mount consisting of two separate base and ring assemblies.

Type metal lead alloys of tin and antimony used in the printing art and classified depending upon their use such as electrotype, linotype, monotype and stereotype. Also used for casting bullets.

Tyro a novice or beginner in the art of shooting, as in any endeavor.

U

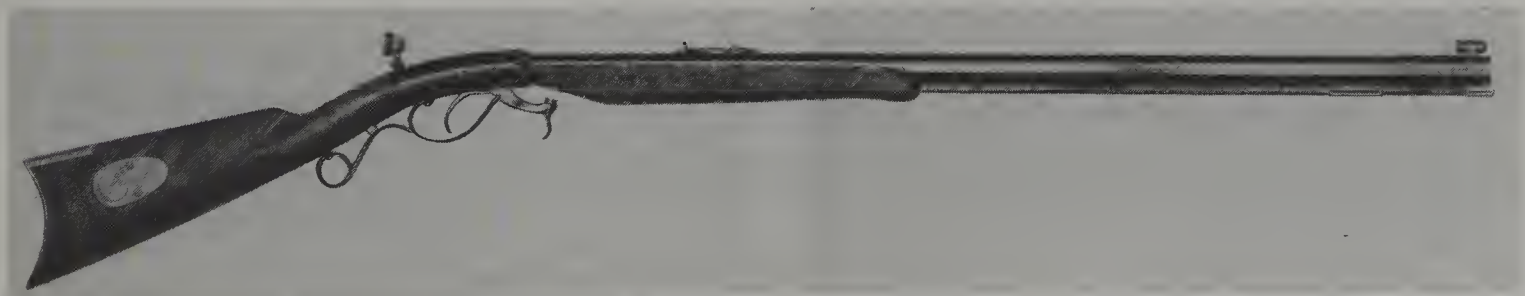
Ultra-violet light an invisible "light" radiation of frequencies next higher than those of visible violet. Used in firearms identification to photograph powder combustion deposits on skin and clothing that are not otherwise detectable.

U.M.C. intials used as the headstamp for cartridges manufactured by the Union Metallic Cartridge Company of Bridgeport, Connecticut — a firm that was founded in 1866 and which, in 1902, was merged with the Remington Arms Company.

Unarmed without weapons. Fuzes are said to be unarmed when they are neutralized by some mechanical device which keeps them from exploding.

Under arms the bearing of firearms in the hands or on the person.

Underhammer firearms firearms having the ham-



underhammer firearms

mer beneath rather than on top of the piece. While used in Europe during the flintlock period, their greatest development occurred in the United States during the period 1835-1850. Underhammer percussion rifles and pistols are produced to this day by the Hopkins & Allen Company, 3 Ethel Ave., P.O. Box 217, Hawthorne, New Jersey 07507.

Underlugs the locking lugs of a break-open type firearm, such as a double barrel shotgun; located on the bottom flats of the barrels, directly under the chamber area, and which lock into the forward channel of the receiver.

Union Metallic Cartridge Company an ammunition manufactuing firm founded in Bridgeport, Connecticut, in 1866 and which, in 1902, was merged with Remington Arms Company. Small arms ammunition made by this firm carried the headstamp "UMC."

United States Pigeon Shooting Association an organization interested in pigeon shooting, having its headquarters in Fort Worth, Texas.

United States Revolver Association a national organization of those interested in revolver and pistol shooting, founded 1900 and having headquarters in Springfield, Massachusetts.

Unload to completely remove without firing, all of the cartridges or shells from a firearm or cannon.

Unserviceable a weapon that because of its condition cannot be used for its intended purpose.

Upwind the direction from which the wind is blowing, also called windward.

Usable rate of fire the normal rate of actual fire of a gun, measured in shots per minute. The maximum rate of fire is a calculated theoretical rate and is considerably greater than the usable rate.

V

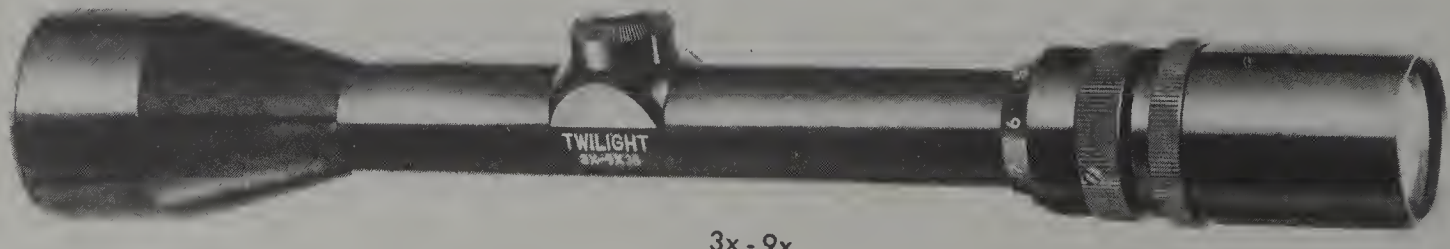
Vacuum the absence of any matter. The noise of an explosion or detonation is caused by the rush of surrounding air to fill the vacuum caused in space by the sudden removal of oxygen which unites with the chemical of the explosive or detonating mixture, resulting in shock waves in the atmosphere. The rapidity of such combustions is indicated by the rate of detonation of TNT which is from 17000 feet per second to about 25000 feet per second, depending upon its density of packing.

Valley Forge Pennsylvania, the winter encampment of General Washington, 1777–78, was the location of the forge by that name operated for the manufacture of iron products from 1757 until destroyed Sept. 21, 1777, by British troops under General Howe. Rebuilt after the war it was converted in 1821 into an arms factory called Valley Forge. Partially destroyed in 1839, it was completely destroyed in 1843. During its gun-making period it produced muskets and pistols for the U.S. Government.

Valmet the brand name applied to assorted firearms manufactured by Valtion Metallitehat (State Metal Works) of Helsinki, Finland.

Vanadium steel a steel containing from 0.16 to 0.25 percent of vanadium. It is characterized by its high tensile strength and high elastic limit.

Variable choke to vary the choke of a shotgun barrel a number of devices for attachment to the barrel have been used, such as: screw-on tube, ventilated sleeve with tube, plain collet and collet with muzzle brake, some of which were designed with automatic adjustments.

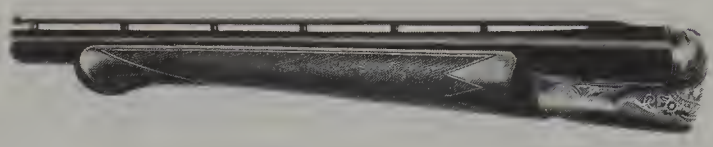


variable scope

Variable scope a riflescope that is adjustable for various powers of magnification.

Varmint bullet a term applied to a light, fast bullet for shooting varmints, designed to fragmentize in small soft bodies and to disintegrate when they strike hard surfaces.

Varminter a trademark for rifles, ammunition and loading tools registered by J.E. Geddy.



ventilated rib

varmint rifle

Varmint rifle a rifle designed specifically for varmint hunting. Such rifles are generally made in light, high velocity calibers for precision shooting at ranges averaging 100 to 300 yards. Typical varmint rifle calibers are: .222, .223, .220, .22/250, .243 and 6MM Magnum. Varmint rifles are generally equipped with high magnification scope sights, crisp target-type triggers and medium to heavy barrels and stocks.

Varnish a resinous solution used to provide a hard lustrous and generally transparent protective surface coating for woods. Many kinds of resins and solvents are used, but broadly, varnishes are classified according to the general character of the solvent used, or spirit varnishes or oil varnishes. The various kinds of varnishes are best sorted to specific purposes in their use. Most gunsmiths do not recommend varnish for gun stocks and especially not for walnut stocks. Lacquer, a special form of varnish is considered suitable.

Velocity speed of a projectile usually measured in feet per second (fps).

Vent a gas escape hole in modern weapons.

ventilated choke device

Ventilated choke device an adjustable choke device having a vented sleeve designed to reduce recoil.

Ventilated rib a sighting rib on top of the barrel of a shotgun, rifle, or handgun and parallel to it, provided with slots to permit the circulation of air to give a cooling effect and thus to prevent distortion of the sight picture.

Ventilated sleeve See "ventilated choke device."

Verdigris (VER di grease) the green or bluish deposit sometimes formed on copper, brass or bronze surfaces after lengthy exposure to the atmosphere.

Verification fire preparatory fire to test the adjustment of guns and sights.

Vernier a short graduated scale that slides along the divisions of a larger graduated scale to indicate subdivisions of the graduations of the larger scale.

Vernier caliper a caliper provided with a vernier to permit precision measurement of gun parts, cartridges, cases, bullets and firearms accessories.

Vernier sight a sight adjustable for elevation or windage by a screw having vernier calibrations marked thereon.

Vertical deviation See "range deviation."

Vertical jump the angle measuring the vertical distance the muzzle of a gun shifts between the instant of firing and the instant the projectile leaves the gun. Its horizontal equivalent is called "lateral jump."

Very pistol a type of pistol used to fire signal flares, invented in 1877 by Lieutenant Edward W. Very of the U.S. Navy.

Vibration one of the three movements set up in a firearm upon discharge, namely recoil, jump and vibration.

Vickers hardness test a means for determining the

relative hardness of a substance by applying pressure to a square based diamond pyramid with its point resting on the surface of a material. The amount of penetration, the size of the load, and time it is applied, are the factors used to determine the Vickers hardness number.

Vickers machine gun a modern version of the Maxim machine gun.

Vieille, Paul Marie Eugene (1854-1934) VYAAH yee a French engineer who, in 1884, developed for the French Government the first successful smokeless powder for rifles. Earlier French chemists, Pelouze and Braconnet had worked on this problem as early as 1832.

Vignetting (vin YET ing) the effect produced by poor or faulty optical instruments in which the edges of a transmitted image tend to blur.

Virginia Manufactory (Armory) established by the State of Virginia in 1802, at Richmond, to provide arms, ammunition and accessories to its militia. It was a substantial manufacturing facility for approximately twenty years. In 1860, it was reactivated for the purpose of converting its earlier flintlock arms to the percussion system. Machinery from the Harper's Ferry arsenal was moved to the Virginia Manufactory after the seizure of the former by Virginia State forces. The Virginia Manufactory produced a considerable number of arms for the Confederacy during the Civil War.

Virtual image an image resulting from the apparent intersection of light rays.

Viscosity the resistance offered to a flowing movement caused by a sort of internal friction in a substance. In the case of oils as temperature rises the viscosity decreases. Animal or vegetable oils maintain their viscosity better than mineral oils as temperature rises. The lower the viscosity the "lighter"the oil.

Visibility the average greatest distance toward the horizon at which prominent objects may be seen and identified by the naked eye.

Volcanic the name given in 1855 to certain pistols and rifles whose manufacture started in 1854 and continued only to 1860. Of historical importance since it represented an intermediate stage in the development of the Jennings percussion repeating rifle into the Henry rifle which in turn became the first Winchester rifle.

Volley a burst of simultaneous fire from a number of guns. From the 14th century on, the grouping of a number of barrels together in a unitary mount, frame or carriage for simultaneous fire, has been experimented with.

Vostok TUZ-35 a Russian free pistol, .22 caliber long rifle, single shot.

W

Wabble means the same as "wobble," to rotate unevenly so that side to side movement takes place.

Wad column the plastic, or combination of cardboard and fibre devices contained in a shotgun shell which serve to contain the gases generated by the powder charge and simultaneously cushion and protect the shot charge. Also used as fillers so that various combinations of powder and shot can be made to fill the case and thus facilitate proper crimping. Before the advent of present day one-piece plastic wads, shotshells were loaded with a heavy cardboard wad, located over the powder charge, and this was called the "nitro" or "over-powder" wad. On top of the cardboard wad there was usually placed one or more fibre or felt cushioning wads designed to raise the shot level to crimping height. The "over-shot" wad which was common to roll crimped shotshells has been eliminated by the newer crimp process.

Wad cutter a bullet having a square shoulder at or near the nose, so designed to produce a clean round hole in a paper target.

Wadding 1. see "wad column." 2. a paper or cloth patch used by shooters of muzzleloading guns to hold the shot against the powder charge. See "patch."

Wads See "wad column."

Waisted pellet a pellet for an air or CO_2 gun that flares outward from its waist-like constricted mid section to its base. Also called a "skirted pellet."

Walker Colt the revolver model produced in 1847 by the factory of Eli Whitney Jr., at Whitneyville, Connecticut. Approximately 1100 pieces were manufactured in .44 caliber.

Wall gun a flintlock made with a leg hinged to the underside of the barrel to give it support in firing, such as behind or on top of a wall. Also called a rampart gun.

Wall piece a large sized firearm often an arquebus mounted on a swivel and placed atop the wall of a fortress, or a similar gun with a recoil plate or hook adapted to be placed against such a wall to absorb part of the recoil.

Walnut (Juglans) the name of the genus or family of trees whose species are found in many parts of the world. Its wood is highly prized for its gunstock qualities but the shortage of supply in the face of heavy demand has caused many other woods to be used for gunstocks.

Walther pistols a line of handguns, in assorted calibers, made by the Walther firm which is now located in Ulm, West Germany. Models include: TP, PP, PPK, OSP, P-38 and models 8, 9 and Olympia. Probably best known for their 9mm caliber P-38 auto pistol which replaced the Luger as the standard issue for the German army during the 1930's. Some of these models are still in production, including the P-38, and are sold in the U.S. by Interarmco.

W & E abbreviation for windage and elevation.

Washita oilstone a natural stone used as for edging cutting tools. See "oilstone."

Waste of cotton or wool is frequently used as a bullet stop. Especially when it is desired to recover a fired bullet without the risk of deformation that would occur if it struck a solid object. See "identification of firearms."

Water jacket a casing for holding water, surrounding the barrel of a water cooled machine gun.

Water table the flat part of the action of a side by side double barrelled shotgun that extends forward from the bottom of the breech face substantially at right angles to it. Also called the action bar flats.

Watt, James (1736–1819) the inventor of the steam engine who cooperated with Rev. Alexander John Forsyth in inventing several types of percussion locks.

Wave a series of advancing impulses set up in the air by an explosion.

Wax bullet bullets made of paraffin wax for use in primed cartridge cases without the usual powder charge. Used for short range target practice with either rifle or revolver. Cannot be used in automatic weapons.

WCF abbreviation for Winchester Center Fire.

Weapon any instrument capable of doing injury in combat.

Weapon system a weapon and those components required for its operation. This term is not precise unless specific parameters are established.

Weatherby a trademark of Weatherby Inc., 2781 Firestone Boulevard, South Gate, California.

Weaverscope the registered trademark of W. R. Weaver Company for rifle scopes.

Webley a caliber .455, six chambered revolver adopted in 1887 as a standard by Great Britain and finally discontinued from Army use in 1947. The name also applies to other firearms made by the English firm of Webley & Scott, Ltd., successor to the businesses originally started by Philip Webley and James Webley.

Weight the weight of a firearm bears a direct relationship to its intended use as well as to the age and physical size of the user. It is an important factor in determining the amount of recoil experienced by the shooter.

Weld to join two parts, usually of metal, by heating or by compression alone. See "welding."

Welding (autogenous fusing) 1. forge welding consists in heating two similar metals almost to the melting point and causing their abutting surfaces to fuse together under pressure. Damascus barrels were so made. 2. electric arc welding, also called resistance welding consists in passing an electric current across the juncture of two similar metals, an electro-welding rod carrying the positive charge to the grounded metal. 3. resistance forge welding combines the use of both pressure and an electric current. 4. gas welding, also known as oxyacetylene welding, accomplishes the joining of similar metals by the generation of heat with an oxygen and acetylene fed torch.

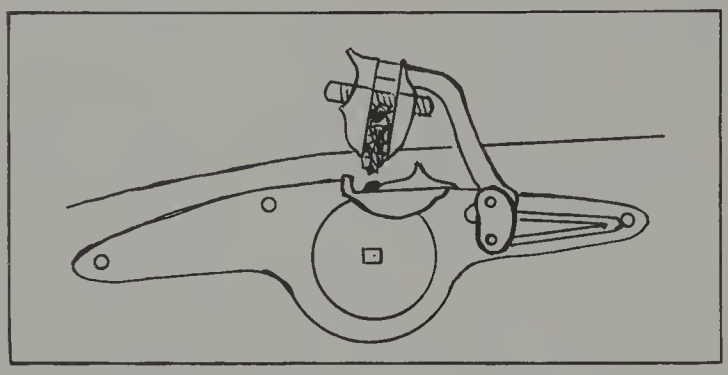
Wesson, Daniel Baird (1825–1906) an American gunsmith and manufacturer of revolvers and cartridges whose association with Horace Smith gave rise to the famous Smith and Wesson combination.

Western a trademark of an ammunition manufacturing division of Winchester Repeating Arms Company located in East Alton, Illinois.

Westley Richards All-Range Bullet a cylindrical lead core necked down a short distance behind its flat nose, the portion below the neck being encased in a jacket of harder metal. Designed for expansion. This bullet was originally intended for sporting use in the 7.63mm Mauser. Introduced in England about 1900, it later was also made in Germany. This was the forerunner of the present day Westley Richards capped bullets used in large caliber hunting rifles.

Westley Richards All-Range Capped Bullet a cylindrical lead core enclosed in a jacket of harder metal extending over the flattened nose to form a rounded protective nose cap.

Whaling gun originally a simple harpoon gun, followed by a gun that propelled a lance having an explosive head. Fixed, swivel and shoulder guns of great variety have been used through the years. Today, a muzzle or breechloading gun (usually swivel mounted) is used to propel a harpoon having a time-fused explosive head.



wheellock

Wheellock a firearms ignition system that relied upon a revolving, spring loaded steel wheel having a roughened knurled or grooved periphery, striking a piece of pyrites or flint to cause sparks to ignite the priming powder and to flash fire down the touchhole thus setting off the powder charge. The sparking action is similar to that found in modern cigarette lighters. The wheellock was developed about 1517 AD. It followed the matchlock and was in turn followed by the snaphaunce.

Whelen, Townsend (1877–1961) hunter, target shooter and author of a number of articles and books on those topics, served for 40 years in the United States Army reaching the rank of Colonel. In the Ordnance Department he, at one time, commanded Frankford Arsenal and later was Director of Research and Development at Springfield Armory.

Whip pistol an oddity, being a pistol concealed in a whip stock, and used as late as the 18th century.

White, Rollin (1818–1892) an American gunsmith and inventor, who, after leaving the employ of Colt's Armory, invented, and patented in 1855, the bored through revolver cylinder which permitted loading from the rear. Daniel B. Wesson, in 1856, acquired exclusive rights to this patent and used it with his self primed metallic cartridges.

Whitney, Eli (1765–1825) an American inventor and manufacturer who founded a manufacturing facility at a site that came to be known as "Whitneyville" in Connecticut. Eli Whitney attained fame as the inventor of the cotton gin and as the inventor of a milling machine that made possible the principle of interchangeable parts in mechanical devices. He was also involved in the production of firearms as early as 1798. The Eli Whitney who collaborated with Samuel Colt to produce the Colt revolvers, which came to be known as the "Whitneyville Walkers" (circa 1846), was actually the son of the elder Eli Whitney and who had succeeded his father in directing the operations of the Whitneyville, Connecticut, factory.

Wildcat cartridges cartridges made by other than recognized commercial producers or cartridges other than standard.

Wild shot a shot completely outside the normal pattern of dispersion or one that is fired without aiming.

Wilkinson, John (1728–1808) an ironmaster and inventor who, in 1789, received a British patent for a barrel for a percussion gun having two spiral grooves adapted to accommodate a projectile having belts or wings to fit the grooves. He is also credited with building the first boring machine in 1775.

Winchester the trademark of Winchester Repeating Arms Company and by which firearms made by it have been known since 1866. The most famous of its firearms are lever action repeating rifles.

Winchester, Oliver F. (1810–1880) an American manufacturer of firearms, both rifles and pistols, but best known for production of the B. Tyler Henry repeating rifle, the forerunner of the Winchester lever action repeating rifle. Founder of Wincheater Repeating Arms Co.

Wind air in motion. It exerts a force on every object in its path and depending upon the dimensions of a projectile and its time of flight, the direction and strength of the wind can materially effect the accuracy of fire.

Windage 1. the influence of the wind in deflecting a projectile from its course in flight. 2. the amount of sight adjustment in azimuth to compensate or allow for the action of the wind on the projectile in flight. 3. the obsolete meaning was the space in a smoothbore firearm between the bore and its projectile which was provided by way of a tolerance to facilitate loading. In a U.S. cannon it was usually about 1/40 of the diameter and caused a loss of velocity nearly proportional to the windage.

Windage knob the rotatable knob built into the adjusting mechanism of an iron sight or telescopic sight and which is used to make horizontal adjustment in the sight setting.

Windage micrometer an instrument connected with the rear sight of a firearm to permit minute adjustments of the sight, in azimuth, for windage allowance.

Windage scale a table or scale for adjusting a sight to allow for the effect of the wind on a projectile in flight. Also called wind gage.

Wind and drift chart a chart showing the degree of sight adjustment required to allow for the effect of wind and drift of a projectile in flight, for various ranges and wind velocities.

Wind component indicator a device that mechanically determines the range and deflection components of the computed wind that is equivalent to all true winds encountered by a projectile in flight.

Wind cone a hollow truncated cone pivoted on a mount to show the direction of the wind. It performs the same function as a wind sock.

Wind correction an adjustment required in sighting to allow for the effect of wind velocity on a projectile in flight.

Wind deflection the deflection or change in course of a projectile in flight caused by wind velocity.

Wind direction is expressed in a number of terms. The system employed by shooters is known as the "horizontal clock system." See "cross wind," "fishtail wind," "leeward," "tailwind," "upwind," "wind," "windward."

Wind doping the process by which each rifleman attempts to gage the effect of wind on his shooting. Mechanical wind estimating devices are usually barred from match competition. As a result, each competitor develops his own peculiar method for estimating wind: some study the effect of the wind on range flags, others study the wind's effect on grass, trees, etc.

Wind gage See "windage scale."

Wind gun the name by which air guns were known prior to 1800, at which time the term "air gun" first came into use.

Wind rule the term applied to a formula that may be used to roughly determine the allowance to be made in aiming a gun when the wind is blowing at a known velocity and direction, namely, the minutes of angle to allow for a right angle cross wind equals the range in hundred of yards times the velocity of the wind in miles per hour divided by a number which is a constant for the gun being used. The constant for the M1 and M1903 rifle is 10; for the U.S. carbine caliber .30 M1 it is 5. Thus, using the formula for the M1 rifle at 300 yards, with a cross wind of 10 mph, the minutes of angle equals 3 which at 300 yards equal 9 inches. Using it with the M1 carbine under the same conditions, the minutes of angle equals 6, which at 300 yards is 18 inches.

Windshield a cap of relatively light material fixed over the head of a projectile to streamline it and thus increase its efficiency in flight.

Wind sock a cone shaped fabric sleeve which bellies out and pivots to show the direction of the wind. It performs the same function as a wind cone.

Wind vane any pivoting or swivelling device designed to indicate wind direction.

Windward the direction from which the wind blows, the side that is exposed to oncoming wind.

Wing safety a type of safety device frequently found on bolt action rifles. Most common to the Mannlicher, Mauser and Springfield systems. The wing safety is located at the rear of the bolt body and is anchored at

wing safety

one end by a pin whose axis parallels that of the bore. The safety pivots on this pin, describing an arc of approximately 180 degrees and positively locks both the firing pin and the bolt.

Wing shooting the practice of shooting at a flying target, with anything, however, this term is generally used when referring to airborne targets fired at with a shotgun.

Wiper a pair of twisted pointed rods secured to the end of a ramrod or cleaning rod to hold cleaning patches when swabbing the bore of a gun.

Wobble to rotate unevenly so that side to side movement takes place. Sometimes also spelled wabble.

Wood has been used since early days for firearms stocks and grips, principally to take advantage of its lightness, workability and heat insulating qualities. See Appendix.

Wood filler may be in paste or liquid form and usually contain silica or barytes, boiled oil and japan drier and sometimes a stain. Used to fill and seal the pores in gunstock woods, usually before the first finishing coat is applied.

Wood's metal an alloy of low melting point containing bismuth, lead, tin and cadmium, melting at about 149°F. See Appendix.

Woodworth cradle rest a cradle designed by A. Woodworth, a Springfield Armory Ordnance Engineer, whereby a conventional rifle in its stock can be held and fired in the Mann V Block.

worm

Worm a screw secured at the end of a ramrod to permit an unfired projectile, powder and patch to be withdrawn from a muzzleloading gun. See "ball screw."

WRF an abbreviation for Winchester Rim Fire.

Wriggle engraving a term applied to a form of metal decoration consisting of fine parallel grooves each formed by a series of closely spaced short zig-zag lines.

Wrought iron iron containing comparatively little carbon but containing slag — the best wrought iron

contains about 3% by weight of slag. It can be readily welded and it can be forged more easily than steel. While it cannot be hardened or heat treated like steel, it can be case hardened by use of cyanide of potassium. It is generally unsatisfactory for bearing surfaces.

Wundhammer bulge or swell the creation of Louis Wundhammer, an American gunsmith, the Wundhammer swell consists of a raised area in a handgrip, found in either a pistol grip or rifle grip, designed to fit snugly into the palm of the shooter's trigger hand. It serves to position the hand in consistently the same attitude and aids the independent motion of the trigger finger.

X

X-ring a small area circled in the center of a bulls-eye used to illustrate near-perfect hits. Shots within the x-ring are counted to break ties when identical scores are attained by two or more competitors. When the x-ring is employed, scores are recorded in this manner: "200-15X's," "200-14X's," "200-13X's," etc. (the marksman having 15X's would be declared the winner).

Y

Yards error the distance in yards from the point of impact to the target. A term commonly used in artillery fire. A companion term is "mils error" which measures the error by the angular unit of "mil." See "mil."

Yaw to edge sidewise from the direction of travel. Specifically the angle between the longitudinal axis of the projectile and the line drawn tangent to its trajectory at the center of gravity of the projectile.

Yerger a corruption of the German "Jaeger", also known as the Harper's Ferry Rifle.

Yield point the point at which a bar of ductile metal, when stretched under load, will further extend without an increase in the loading. It is not the same as the "elastic limit" but occurs beyond it. For example, in structural steel it occurs from 3,000 to 6,000 pounds per square inch beyond the elastic limit of the steel.

Yoke See "crane."

Z

Zero See "zero sight adjustment."

Zero deflection the adjustment of a sight exactly parallel to the axis of the gun upon which it is mounted.

zeroing rest

Zero shot shot fired to test the alignment of sights.

Zero sight adjustment the adjustment of the rear sight in elevation and/or azimuth to place a properly aimed shot at the desired point of impact at a given range with a given load, in the absence of wind. It is the basis from which subsequent sight adjustments may be made to allow for different loads, different ranges, and/or different weather conditions.

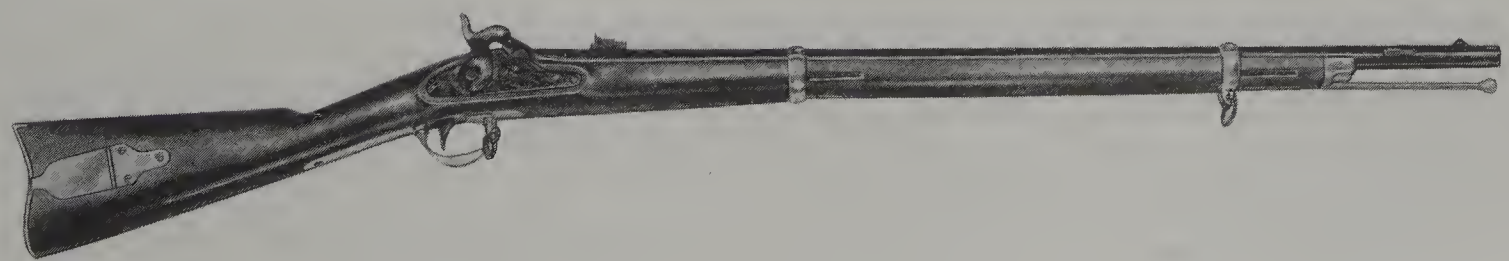
Zero-in to adjust the sight setting of a rifle or handgun by carefully calibrated firing on a shooting range. The experienced shooter generally tries to select a day when there is little or no wind to accomplish this task. Rezeroing is required whenever the shooter makes a significant change in his ammunition, such as a change in make or bullet weight.

Zeroing rest a forearm rest used by a rifleman when zeroing-in a rifle. Zeroing rests come in many different forms and can range from a simple log to a pedestal rest (as illustrated) or to elaborate bipod or tripod arrangements that one may use from a benchrest.

Zig-zag revolver a Derringer in which the barrels are revolved by means of a stud engaging the angular grooves in the barrel. Among gun collectors the term "zig-zag" is generally connected with the rare Remington Zig-Zag Derringer.

Zig-zag pistol a multibarrelled pistol with a unitary barrel cluster resembling the "pepperbox." The barrel cluster is revolved by a stud engaging angular grooves let into the exterior surface of the unit. Among gun collectors the term zig-zag is generally connected with the .22 caliber Remington Zig-Zag Derringer made in the early 1860's. (May also be referred to as Zig-Zag revolver.)

Zinc is a bluish-white crystalline metal element whose chemical symbol is Zn. It is polymorphous, its physical properties varying according to its form as well as to the heat treatment accorded it. Alloyed with copper it produces brass which finds use in the manufacture of cartridge cases and primers.



zouave rifle

Zip gun a term commonly applied to a crude, homemade firearm whose firing pin is powered by a rubber band.

Zouave a rifled musket of .58 caliber produced by the Springfield Armory and patterned from the Remington Model 1863 U.S. Military musket. Noted for its accuracy, the Zouave was very popular with Union soldiers during the Civil War. The name "Zouave" also applied to a specially recruited Union force that was colorfully uniformed, and it is believed the name was applied to the musket because of this unit's insistence upon being so armed.

Zulu the name under which converted French, Belguim and British military percussion muskets were sold as single barrel breech loading shotguns from 1870 on.

Appendices

APPENDIX

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TABLE I

Important Chemical Elements

Element	*Chemical Nature*		*First Isolated*		*Melting Point*	
	Symbol		*By*	*Time*	*C*	*F*
aluminum	Al	metal	Woehler	1827	660.2	1220
antimony	Sb	metal	Valentine	15th century	630.5	1167
arsenic	As	metalloid	Magnus	1250	817.	1503
bismuth	Bi	metal	Geoffroy	1753	271.3	520
cadmium	Cd	metal	Stromeyer	1817	320.9	610
carbon	C	metalloid	—	Prehistoric	3550	6422
chromium	Cr	metal	Varquelin	1797	1890	3434
cobalt	Co	metal	Brandt	1735	1495	2723
copper	Cu	metal	—	Prehistoric	1083	1981
gold	Au	metal	—	Prehistoric	1063	1945
iron	Fe	metal	—	Prehistoric	1535	2795
lead	Pb	metal	—	Prehistoric	327.4	621.3
magnesium	Mg	metal	Davy	1808	651	1204
manganese	Mn	metal	Gahn	1774	1244	2271
mercury	Hg	metal	—	300 B.C.	–38.87	–38
molybdenum	Mo	metal	Hjelm	1782	2610	4730
nickel	Ni	metal	Cronstedt	1751	1453	2647
palladium	Pd	metal	Wollaston	1803	1552	2826
platinum	Pt	metal	Watson	1748	1769	3216
samarian	Sa	metal	deBoisbaudran	1879	1072	1962
silicon	Si	metalloid	Berzelius	1823	1410	2570
silver	Ag	metal	—	Prehistoric	960.8	1761
sodium	Na	metal	Davy	1807	97.8	208.1
sulphur	S	metalloid	—	Prehistoric	116	241
tantalum	Ta	metal	Ekeberg	1802	2996	5425
tin	Sn	metal	—	Prehistoric	232	450
tungsten	W	metal	d'Elhujar	1783	3410	6170
vanadium	V	metal	Roscoe	1869	1890	3434
zinc	Zn	metal	Marygraf	1746	419	788
zirconium	Zr	metal	Berzelius	1824	1852	3365

TABLE II

Metals Common to Firearms

Metal	*% Composition*	*Melting Point*	
		C	*F*
Aluminum	100 Al	6602	1220
babbitt metal	89 Sn, 7.5 Sb, 3.5 Cu	241	466
brass, ordinary yellow	67 Cu, 33 Zn	940	1724
brass, cartridge	70 Cu, 30 Zn, Pb, Fe	916	1680
bronze, commercial	90 Cu, 10 Zn	1050	1922
bronze, gun metal	90 Cu, 10 Sn	1000	1832
cast iron, gray	94 Fe, 3.5C, 2.5 Si	1230	2246
cast iron, white	97 Fe, 3C	1150	2102
chromium	100 Cr	1890	3434
copper	100 Cu	1083	1981
iron	100 Fe	1535	2795
lead	100 Pb	327.4	621.3
lead shot	99.8 Pb, 0.2 As	327.4	621.3
manganese	100 Mg	1244	2271
manganese steel	86 Fe, 13 Mn, 1C	1510	2750
nickel	100 Ni	1453	2647
nickel steel	96.5 Fe, 3.5 Ni	1530	2786
nickel chrome steel	95.1 Fe, 3 Ni, 1.5 Cr, 0.4 C	—	—
silver solder *Grade 6	65 Ag, 20 Cu, 15 Zn	693	1280
*Grade 8	80 Ag, 16 Cu, 4 Zn	738	1360
solder, half and half **Grade 1A	50 Pb, 50 Sn, .12 Sb	181	357.8
soft **Grade 3A	60 Pb, 40 Sn, .12 Sb	181	357.8
soft **Grade 5B	67 Pb, 31 Sn, 2 Sb	188	370.4
stainless steel	90 Fe, 8 Cr, .4 Mn>.12C	1450	2642
steel	99 Fe, 1 C	1430	2606
tin	100 Sn	232	450
type metal			
electrotype	94 Pb, 3 Sn, 3 Sb	299	570
linotype	84 Pb, 4 Sn, 12 Sb	246	475
monotype	76 Pb, 8 Sn, 16 Sb	213	515
stereotype	80 Pb, 6 Sn, 14 Sb	260	500
wood's metal	50 Bi, 25 Pb, 12.5 Sn, 12.5 Cd	65	149
wrought iron	98.5 Fe, slag	1510	2750
zinc	100 zn	419	788

**ASTM Spec. B73–29*
***ASTM Spec. B32–21*

TABLE III

Woods For Gunstocks

Below is a list of the most frequently used gunstock woods together with an appraisal of their characteristics. Since woods of the same species may vary greatly in their physical properties, due to the many factors that influence the growth of the trees, the ratings given here are based on generally accepted values, and, in those cases where experts differ the majority opinion has been indicated.

KEY		
H-heavy	*P-poor*	*E-excellent*
M-medium	*F-fair*	
L-light	*G-good*	

	Weight	*Checkering*	*Strength*	*Hardness*
acacia	M	G	E	E
apple	M	G	G	E
ash	H	F	E	E
balsimo	M	E	G	G
beech	M	F	G	G
birch	L	P	G	G
*blackwood (Australian)	M	G	E	E
butternut (white walnut)	M	E	E	E
cherry	M	G	E	E
cocobolo (See note)	H	P	G	G
desert ironwood	H	P	E	E
*ebony	H	E	E	E
*gumwood	H	P	E	E
*jarrah	H	P	E	E
maple (sugar, rock, black, etc.)	H	G	E	E
red, silver	M	P	P	F
Pacific	M	F	P	F
queensland	L	P	G	G
*mahogany, African	H	P	G	G
mesquite	H	E	E	E
myrtle, Oregon	M	F	P	F
*rosewood	H	G	G	G
pine	L	P	P	P
spruce	L	P	P	P
teak	H	P	G	E
redwood burl	L	P	G	F
walnut, American black	M	E	E	E
Argentine	L	G	G	G
New Zealand	H	G	G	G
circassian	M	E	E	E
California claro	M	F	G	G
*zebrawood (zingana)	H	P	F	F

NOTE: Care should be exercised when working with Cocobolo wood to avoid contact with its fine sawdust. This wood has a tendency to produce a skin poisoning much like ivy poisoning. Though not everyone reacts to this poisoning, the consequences can be painful to those who do.

**these woods are generally used only for fancy stock attachments, such as forend tips and grip caps. Rarely, if ever, are they used for complete stocks, however, most can be used for making handgun grips.*

TABLE IV

English-Metric Length Conversions

Millimeters to Decimals of an Inch

mm	*Decimals*
1.	.0394
2.	.0787
3.	.1181
4.	.1575
5.	.1968
6.	.2362
7.	.2756
8.	.3150
9.	.3543
10.	.3937
.1	.004
.2	.008
.3	.012
.4	.016
.5	.020
.6	.024
.7	.028
.8	.031
.9	.035
.01	.00039
.02	.00079
.03	.00118
.04	.00157
.05	.00197
.06	.00236
.07	.00276
.08	.00315
.09	.00354

Decimals of an Inch to Millimeters

Decimals	*mm*
.1	2.540
.2	5.080
.3	7.620
.4	10.160
.5	12.700
.6	15.240
.7	17.780
.8	20.320
.9	22.860
1.0	25.400
.01	.254
.02	.508
.03	.762
.04	1.016
.05	1.270
.06	1.524
.07	1.778
.08	2.032
.09	2.286
.001	.025
.002	.051
.003	.076
.004	.102
.005	.127
.006	.152
.007	.178
.008	.203
.009	.229

Fractions of an Inch to Decimals and Millimeters

Fraction	*Decimal*	*mm*
1/64	.0156	0.397
1/32	.0313	0.794
3/64	.0469	1.191
1/16	.0625	1.588
5/64	.0781	1.984
3/32	.0937	2.381
7/64	.1093	2.778
1/8	.1250	3.175
9/64	.1406	3.572
5/32	.1562	3.969
11/64	.1718	4.366
3/16	.1875	4.763
13/64	.2031	5.159
7/32	.2187	5.556
15/64	.2343	5.953
1/4	.2500	6.350
17/64	.2656	6.747
9/32	.2812	7.144
19/64	.2968	7.541
5/16	.3125	7.938
21/64	.3281	8.334
11/32	.3437	8.731
23/64	.3593	9.128
3/8	.3750	9.525
25/64	.3906	9.922
13/32	.4062	10.319
27/64	.4218	10.716
7/16	.4375	11.113
29/64	.4531	11.509
15/32	.4687	11.906
31/64	.4843	12.303
1/2	.5000	12.700

To convert inches to millimeters multiply by 25.4
To convert millimeters to inches multiply by .0394

TABLE V

English-Metric
Weight Conversions
Conversion of grams (metric) to grains (English)

Grams (g)	.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
1	15.4	16.9	18.5	20.1	21.6	23.1	24.7	26.2	27.8	29.3
2	30.9	32.4	34.0	35.5	37.0	38.6	40.1	41.7	43.2	44.8
3	46.3	47.8	49.4	50.9	52.5	54.0	55.6	57.1	58.6	60.2
4	61.7	63.3	64.8	66.4	67.9	69.4	71.0	72.5	74.1	75.6
5	77.2	78.7	80.2	81.8	83.3	84.9	86.4	88.0	89.5	91.0
6	92.6	94.1	95.7	97.2	98.8	100.3	101.9	103.4	104.9	106.5
7	108.0	109.6	111.1	112.7	114.2	115.7	117.3	118.8	120.4	121.9
8	123.5	125.0	126.5	128.1	129.6	131.9	132.7	134.3	135.8	137.3
9	138.9	140.4	142.0	143.5	145.1	146.6	148.1	149.7	151.2	152.8
10	154.3	155.9	157.4	159.0	160.5	162.0	163.6	165.1	166.7	168.2
11	169.8	171.3	172.8	174.4	175.9	177.5	179.0	180.6	182.1	183.6
12	185.2	186.7	188.3	189.8	191.4	192.9	194.4	196.0	197.5	199.1
13	200.6	202.2	203.7	205.2	206.8	208.3	209.9	211.4	213.0	214.5
14	216.0	217.6	219.1	220.7	222.2	223.8	225.3	226.9	228.4	229.9
15	231.5	233.0	234.6	236.1	237.7	239.2	240.7	242.3	243.8	245.4
16	246.9	248.5	250.0	251.5	253.1	254.6	256.2	257.7	259.3	260.8
17	262.3	263.9	265.4	267.0	268.5	270.1	271.6	273.1	274.7	276.2
18	277.8	279.3	280.9	282.4	283.9	285.5	287.0	288.6	290.1	291.7
19	293.2	294.8	296.3	297.8	299.4	300.9	302.5	304.0	305.6	307.1
20	308.6	310.2	311.7	313.3	314.8	316.4	317.9	319.4	321.0	322.5
21	324.1	325.6	327.2	328.7	330.9	331.8	333.3	334.9	336.4	338.0
22	339.5	341.0	342.6	344.1	345.7	347.2	348.8	350.3	351.9	353.4
23	354.9	356.5	358.0	359.6	361.1	362.7	364.2	365.7	367.3	368.8
24	370.4	371.9	373.5	375.0	376.5	378.1	379.6	381.9	389.7	384.3
25	385.8	387.3	388.9	390.4	392.0	393.5	395.1	396.6	398.1	399.7
26	401.2	402.8	404.3	405.9	407.4	408.9	410.5	412.0	413.6	415.0
27	416.7	418.2	419.8	421.3	422.8	424.4	425.9	427.5	429.0	430.6
28	432.1	433.6	435.2	436.7	438.3	439.8	441.4	442.9	444.4	446.0
29	447.5	449.1	450.6	452.2	453.7	455.2	456.8	458.3	459.9	461.4
30	463.0	464.5	466.0	467.6	469.1	470.7	472.2	473.8	475.3	476.8

To convert grams to grains multiply by 15.432
To convert grains to grams multiply by 0.0648
To convert grains to pounds divide by 7000.

English Metric
1 grain = 0.0648 grams
1 ounce (avdp) = 28.3495 grams
1 pound = 0.4536 Kilograms
1 long ton = 1016 Kilograms
1 short ton = 907.18 Kilograms

Metric English
1 gram = 15.432 grains
1 gram = 0.0353 ounces (avdp)
1 kilogram = 2.2046 pounds
1000 kilograms = 0.9842 long tons
1000 kilograms = 1.1023 short tons

TABLE VI

Length Equivalents

Millimeters	*Centimeters*	*Meters*	*Inches*	*Feet*	*Yards*	*Statute Miles*
1	0.1	.001	.03937	.00328	.00109	.0000006
10	1	.01	.3937	.03281	.01094	.0000062
1000	100	1	39.37	3.2808	1.0936	.0006214
25.4	2.54	0.0254	1	0.08333	0.02778	.00001578
304.8	30.48	0.3048	12	1	0.3333	.0001894
914.4	91.44	0.9144	36	3	1	.0005682
1609300	160930	1609.3	63360	5280	1760	1

1 Mile = 1.6093 Kilometers
1 Kilometer = 0.6214 Miles

TABLE VII

Volume and Capacity Equivalents

Cubic Inches	*Cubic Feet*	*Cubic Yards*	*U.S. Liquid Quarts*	*U.S. Liquid Gallons*	*Liters*
1	.00057870	.00002143	.017316	.004329	.016387
1728	1	.037037	29.922	7.4805	28.317
46656	27	1	807.90	201.97	764.56
57.75	.033420	.001238	1	0.25	.94636
231	.13368	.004951	4	1	3.7854
61.023	.035315	.001308	1.0567	.26417	1

1 U.S. Liquid Quart = 2 pints = 8 gills = 32 fluid ounces = 256 fluid drams
1 Imperial Gallon = 1.201 U.S. Gallons = 0.1605 cu. ft. = 4.5460 liters
1 U.S. Gallon = 0.8327 Imperial Gallons = 0.13368 cu. ft. = 3.7854 liters
1 Cubic Foot = 6.229 Imperial Gallons = 7.4805 U.S. Gallons

TABLE VIII

Weight Equivalents

Kilograms	*Grains*	*Avoir Ounces*	*Avoir Pounds*	*Short Ton 2000 lbs.*	*Metric Ton 1000 Kg.*
1	15432	35.274	2.20461	.001102	.001
.00006480	1	.002286	.000142	—	—
.028349	437.5	1	.0625	—	—
.45359	700.	16	1	.0005	.0004536
907.18	—	32000	2000	1	.90718
1000.	—	35274	2204.6	1.1023	1

1 avoirdupois ounce = 16 avoirdupois drams
1 dram = 27.4 grains = 1.771 grams
1 avoirdupois ounce = 0.91146 troy and apothecaries ounces
1 troy and apoth. ounce = 1.0971 avoirdupois ounces

TABLE IX

Pressure Equivalents at 62° F

Lbs. Per sq. in	*Lbs. per sq. ft.*	*Atmosphere*	*Feet of Water*	*Inches of Water*	*Inches of mercury*
1	144	.06804	2.31	27.72	2.036
.007	1	.00047	.016	.193	.014
14.696	2116.2	1	33.95	407.37	29.921
.433	62.355	.0295	1	12.0	.871
.036	5.196	.0025	.0833	1	.072
.491	70.704	.0327	1.134	13.61	1

1 U.S. gallon of water weighs 8.336 pounds at 62° F
1 cu. ft. of water weighs 62.355 pounds at 62° F
1 cu. ft. of water weighs 62.316 pounds at 68° F

TABLE X

Velocity Equivalents

Miles per hr.	*Feet per sec.*	*Miles per hr.*	*Feet per sec.*	*Miles per hr.*	*Feet per sec.*	*Miles per hr.*	*Feet per sec.*	*Miles per hr.*	*Feet per sec.*
1	1.47	21	30.80	41	60.13	61	89.47	81	118.80
2	2.93	22	32.27	42	61.60	62	90.93	82	120.27
3	4.40	23	33.73	43	63.07	63	92.40	83	121.73
4	5.87	24	35.20	44	64.53	64	93.87	84	123.20
5	7.33	25	36.67	45	66.00	65	95.33	85	124.67
6	8.80	26	38.13	46	67.47	66	96.80	86	126.13
7	10.27	27	39.60	47	68.93	67	98.27	87	127.60
8	11.73	28	41.07	48	70.40	68	99.73	88	129.07
9	13.20	29	42.53	49	71.87	69	101.20	89	130.53
10	14.67	30	44.00	50	73.33	70	102.67	90	132.00
11	16.13	31	45.47	51	74.80	71	104.13	91	133.47
12	17.60	32	46.93	52	76.27	72	105.60	92	134.93
13	19.07	33	48.40	53	77.73	73	107.07	93	136.40
14	20.53	34	49.87	54	79.20	74	108.53	94	137.87
15	22.00	35	51.33	55	80.67	75	110.00	95	139.33
16	23.47	36	52.80	56	82.13	76	111.47	96	140.80
17	24.93	37	54.27	57	83.60	77	112.93	97	142.27
18	26.40	38	55.73	58	85.07	78	114.40	98	143.73
19	27.87	39	57.20	59	86.53	79	115.87	99	145.20
20	29.33	40	58.67	60	88.00	80	117.33	100	146.67

1 mile = 5280 feet
To convert miles per hour to feet per second multiply by 1.4666
To convert feet per second to miles per hour multiply by .6818

TABLE XI

U.S. — Foreign Cartridge Equivalents

Comparative Auto Pistol Cartridges

.25 A.C.P.	6.35 mm. Browning
.32 A.C.P.	7.65 mm. Browning
No U.S.	7.65 mm. Long (French)
(.30) 7.65 Luger	7.65 mm. Parabellum
(.30) 7.63 Mauser	7.63 Mauser
No U.S.	8 mm. Nambu
No. U.S.	8 mm. Roth Steyr
.380 A.C.P.	9 mm. Browning (short)
	9 mm. Corto (Italian)
No U.S.	9 mm. Browning Long
9 mm. Luger	9 mm. Parabellum
	9 mm. Glisenti
No U.S.	9 mm. Mauser
.38 A.C.P.	.38 Auto (Webley & Scott)
.38 Super A.C.P.	No European
No U.S.	9 mm. Steyr M-1911
No U.S.	9 mm. Bergmann Baynard
.45 A.C.P.	No European
No U.S.	455 W & S

Comparative Revolver Cartridges

No U.S.	7.5 Nagant (Russian)
No U.S.	8 mm. French
.38 S & W	.380 MKI British
	.38-200
No U.S.	9 mm. Jap
.38 Special	No European
.45	No European
.455 Webley	.455 Webley

TABLE XII

Visual Identification of Certain Types of U.S. Military Cartridges and Shot Shells

armor piercing — bullet is black tipped

ball — conventional brass case and fully jacketed bullet

blank, revolver cartridge — .45 caliber, no bullet in case

carbine — characteristic shape and length of about 1.7 in.

dummy, rifle — tinned six fluted case, no primers, or inert primer and holes drilled in gluted case, or merely a tinned case without a primer
Revolver — tinned case with either no primer or holes in case

guard — short, round nose, lead bullet or six short corrugations, just behind neck of case

high pressure test — tinned case

incendiary — bullet is tipped with light blue color

rifle grenade — cal. 30, five petal rose crimp in mouth of case

shot shell — guard use. Brass head extends at least one inch along case

subcalibre — cal. 30 field artillery training ammunition has extracting rim on base of case

tracer — bullet is tipped with red color

TABLE XIII

Black Powder Data For Muzzleloading

For muzzleloading pistols and revolvers the rule of thumb is one-half a grain of black powder for each increment of caliber, i.e.: when loading a .36 caliber pistol the shooter would start with a load of 18 grains of 3Fg or 4Fg powder. Heavier loads are possible, of course, when working with newly made replicas of singleshot pistols or revolvers, however one must work up to the desired load because there is a point at which the recoil or muzzle blast will become objectionable. No attempt should be made to fire an old original, really an antique, before having it checked and tested by a responsible gunsmith.

TABLE OF RECOMMENDED CHARGES
(For Newly Made Replica Rifles & Muskets)

Caliber	*Ball Size*	*Powder*	*Weight of Powder Charge*
.36	.350" Rd.	FFFG	45 grs.
.40	.395" Rd.	FFFG	60 grs.
.44	.433" Rd.	FFFG	60 grs.
.45	.445" Rd.	FFFG	70 grs.
.45	.440" Rd.	FFFG	70 grs.
.50	.515" Rd.	FFFG	50 grs.
.52	.535" Rd.	FFFG	60 grs.
.54	.560" Rd.	FFFG	58 grs.
.54	.565" Rd.	FFFG	68 grs.
.54	.535" Rd.	FFFG	75 grs.
.56	.562" Rd.	FFG	68 grs.
.577	.570"-.575" Rd.	FFG	60 grs.
.58	.570"-.575" Rd.	FFG	60 grs.
.69	.680" Rd.	FFG	70 grs.
.70	.680" Rd.	FG	75 grs.
.75	.740" Rd.	FG	75 grs.

To Weigh Shot on a Grain Scale

Ounces of Shot	*Grains*
½ oz.	218 grs.
¾ oz.	328 grs.
1 oz.	437 grs.
1⅛ oz	492 grs.
1¼ oz	547 grs.
1½ oz	656 grs.
1⅝ oz	711 grs.
1¾ oz	765 grs.
2 oz	875 grs.

Recommended Shotgun Loads
(Note: these charges, particularly the heaviest loads shown for each gauge, are intended for use only in newly manufactured muzzleloaders. Antique guns should be examined by a competent gunsmith and thoroughly tested before use.)

Gauge	*Powder*	*Powder Charge*	*Filler Wad**	*Weight of Shot Charge*
.410	FFG	1¼ drams	⅜"	½ oz.
.410	FFG	1½ drams	⅜"	⅝ oz.
32	FFG	1½ drams	⅜"	½ oz.
32	FFG	1¾ drams	⅜"	½ oz.
28	FFG	2 drams	⅜"	⅝ oz.
28	FFG	2¼ drams	⅜"	⅝ oz.
28	FFG	2⅜ drams	⅜"	⅞ oz.
20	FFG	2 drams	⅜"	¾ oz.
20	FFG	2¼ drams	½"	⅞ oz.
20	FFG	2½ drams	½"	1 oz.
16	FFG	2¼ drams	½"	1 oz.
16	FFG	2½ drams	½"	1 oz.
16	FFG	2¾ drams	½"	1⅛ oz.
14	FFG	2⅜ drams	½"	1 oz.
14	FFG	2¾ drams	½"	1⅛ oz.
12	FFG	2½ drams	½"	1⅛ oz.
12	FFG	3 drams	½"	1⅛ oz.
12	FFG	3¼ drams	½"	1¼ oz.
12	FG	3½ drams	½"	1⅜ oz.
10	FG	3¾ drams	⅝"	1⅜ oz.
10	FG	4 drams	⅝"	1½ oz.
10	FG	4¼ drams	⅝"	1⅝ oz.

**Don't forget to use a card wad over the powder before loading filler wad.*

To Weigh Black Powder on a Grain Scale

Drams of Powder	*Grains*
1 dram	27.4 grs.
1¼ drams	34.2 grs.
1½ drams	41.1 grs.
1¾ drams	47.9 grs.
2 drams	54.8 grs.
2¼ drams	61.6 grs.
2⅜ drams	65.1 grs.
2½ drams	68.5 grs.
2¾ drams	75.3 grs.

Drams of Powder	*Grains*
3 drams	82.2 grs.
3⅛ drams	85.6 grs.
3¼ drams	89.0 grs.
3½ drams	95.9 grs.
3¾ drams	102.7 grs.
4 drams	109.6 grs.
4⅛ drams	113.0 grs.
4¼ drams	116.4 grs.
4½ drams	123.4 grs.

TABLE XIV

Maximum Ranges

Extreme ranges of certain small arms cartridges, determined by testing:

Bullet name	*Bullet wt. (grs.)*	*Muzzle vel. (f.p.s.)*	*Ballistic co-efficient*	*Extreme range (yds.)*
Cal. .22 long rifle	40	1145	.128	1500
Cal. .380 ACP	95	970	.08	1089
Cal. 45 ACP in pistol	234	820	.16	1640
Same in submachine gun	234	970	.16	1760
Cal. .30 Carbine M1	111	1970	.179	2200
Same, Tracer M16	107	1910	.154	1680
Cal. .30 ball, M2	152	2800	.40	3500
Cal. .30 boattail M1	172	2600	.56	5500
Same in sub-caliber gun	172	1990	.56	4300
Cal. .30-40 Krag	220	2000	.34	4050
Same in carbine	220	1920	.34	4000
Cal. 50 AP M2	718	2840	.84	7275

Calculated exteme ranges of certain small arms cartridges

Bullet name	*Bullet wt. (grs.)*	*Assumed M.V. (f.p.s.)*	*Calculated max. range (yds.)*
Cal. .22 WRF	45	1450	1950
Cal. .22 WMR	40	2000	1900
Cal. .30 Mauser Pistol	86	1410	1900
Cal. .30 Luger	93	1220	1900
Cal. .32 S&W Long	98	780	1450
Cal. .38 Special	158	855	1800
Cal. .357 S&W Magnum	158	1430	2350
Cal. .38 Super Auto	130	1140	2050
9 mm. Luger	124	1140	1900
Cal. .44 Remington Magnum	240	1570	2500
Cal. .219 Zipper	56	3110	2850
Cal. .22 Hornet	45	2690	2350
Cal. .243 Winchester	100	3070	4000
Same	80	3500	3500
Cal. .250 Savage	100	2820	3500
Cal. .257 Roberts	100	2900	3850
Cal. .270 Winchester	130	3140	4000
Cal. .280 Remington	125	3140	3700
Cal. .300 H&H Magnum	180	2920	4350
Cal. .338 Winchester Magnum		2700	4660
Cal. .375 H&H Magnum	270	2740	4500
Cal. .458 Winchester F.M.J.	500	2125	4500

Table XIV, Continued

Maximum ranges of shot based on Journee's formula

Shot size	*Diameter (ins.)*	*Maximum range (yds.)*
12-ga. round ball	.645	1420
16-ga. " "	.610	1340
20-ga. " "	.545	1200
410-ga. " "	.38	850
00 buckshot	.34	748
0 "	.32	704
1 "	.30	660
#1 shot	.16	352
#2 "	.15	330
#3 "	.14	308
#4 "	.13	286
#5 "	.12	264
#6 "	.11	242
#7½ "	.095	209
#8 "	.09	198
#9 "	.08	176
#12 " (cal. .22 shot cartridges)	.05	110

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TABLE XV

Mathematical Formulae

Area of a circle = $\pi r^2 = 3.1416r^2$

Circumference of a circle = $\pi d = 3.1416d$

Surface area of a sphere = $\pi d^2 = 3.1416d^2$

Volume of a sphere = $4/3\pi r^3$ or $.5236d^3$

Surface area of a right circular cylinder = $2\pi rh = 6.2832rh$

Volume of a right circular cylinder = $\pi r^2h = 3.1416r^2h$

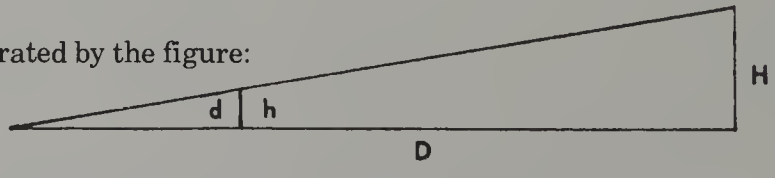
In all of the foregoing r = radius of the circle
d = diameter of the circle
h = height of cylinder

To find the distance (D) to an object of known height (H) having the apparent height (h) of the object and a measured distance (d) from the eye of the observer

$$\frac{D}{d} = \frac{H}{h}$$

$$D = \frac{dh}{h}$$

Illustrated by the figure:



Given any three of the dimensions indicated the fourth may be found by the same formula.

TABLE XVI
Physics Formulae

Temperature reading conversions:

To convert Fahrenheit readings to degrees Centigrade:

$°C = 5/9\ (°F - 32)$

To convert Centigrade readings to degrees Fahrenheit:

$°F = 9/5\ (°C + 32)$

Sound and Light

Velocity of sound, still air, 68° F, at sea level = 344 meters or 1129 feet per second.

Velocity of sound, still air, 32° F, at sea level = 331.7 meters or 1088 feet per second.

For each higher degree in temperature add 1.14 feet per second to above.

For each lower degree in temperature subtract 1.14 feet per second from above.

Velocity of light in vacuum = 186,284 miles per second.

To estimate distance in feet from a gun, count the seconds that elapse between seeing the flash of gun fire and hearing the report and multiply by 1130. The velocity of light is so great it is ignored in estimating distances by the flash and sound method.

Free falling bodies, ignoring wind and air resistance

Velocity after falling two seconds = $gt = 32{,}174t$ feet per second.

Distance travelled falling t seconds = $\frac{1}{2}gt^2 = 16.087t^2$ feet

Greatest height attained by a body projected with velocity of v feet per second

$$= \frac{v^2}{2g} = \frac{v^2}{64.35} \text{ feet}$$

Time to travel such height

$$= \frac{v}{g} = \frac{v}{32.174}$$

Mass and Momentum

$$\text{Mass (M)} = \frac{w}{g} = \frac{w}{32.174}$$

$$\text{Momentum} = Mv = \frac{wv}{32.174} \text{ foot pounds}$$

$$\text{Energy} = \tfrac{1}{2}Mv^2 = \frac{1\,wv^2}{2\,g} = \frac{wv^2}{64.35} \text{ foot pounds}$$

In the above M = mass
w = weight in pounds
v = velocity in feet per second

TABLE XVII

Ballistics Formulae

Density of Loading

$$d = \frac{27.68w}{7000s}$$

where d = density of loading
w = weight of powder charge in grains
s = space taken up by powder charge, in cubic inches

Sectional Density

$$SD = \frac{w}{7000d^2}$$

where SD = sectional density
w = weight of bullet in grains
d = diameter of bullet in inches

Bullet Energy

$$E = \tfrac{1}{2}Mv^2 = \tfrac{1}{2}\left(\frac{w}{700 \times 32.174}\right)v^2$$

where E = bullet energy in foot pounds
M = mass
w = weight of bullet in grains
v = velocity of bullet in feet per second

Velocity and Energy of Recoil

$$V = \frac{wv + 4700c}{7000W} \text{ feet per second}$$

$$E = \frac{W}{2g}\left(\frac{(wv + 4700c)^2}{(7000W)}\right) \text{foot pounds}$$

where V = close approximation of velocity of recoil in feet per second
E = close approximation of energy of recoil in foot pounds
W = weight of gun in pounds
w = weight of bullet in grains
c = weight of powder charge in grains
v = muzzle velocity in feet per second

7000 converts the grains of w and c into pounds

4700 is average effective velocity of powder gases in feet per second

Range and Time of Flight in a Vacuum

$$\text{Time of flight to highest point} = \frac{v \sin a}{g} \text{ seconds}$$

Total time to come back to original horizontal plane

$$= \frac{Z\, v \sin a}{g} \text{ seconds}$$

$$\text{Maximum height reached} = \frac{v^2 (\sin a)^2}{2g} \text{ feet}$$

$$\text{Horizontal range} = \frac{v^2 (\sin 2a)}{g} \text{ feet}$$

$$\text{Maximum range (angle 45°)} = \frac{v^2 (\sin 90°)}{g} =$$

$$\frac{v^2}{g} = \frac{v^2}{32.174} \text{ feet}$$

$$\text{Approximate maximum range} = \frac{v^2}{10} \text{ yards}$$

In all the foregoing
v = muzzle velocity in feet per second
a = angle of elevation of gun, in degrees
g = 32.174

Trajectory

Maximum height for given range = $48t^2$ inches where
t = time in flight for given range, in seconds.

Height of ordinate at a given distance from the gun =

$$\frac{d}{1000}(A\text{-}a)$$

where d = distance at which ordinate is sought
A = angle of departure in mils, for the trajectory
a = angle of departure in mils, for a range of d length

Using what is called Sladen's formula, the height of the ordinate at desired point in the trajectory = $\frac{1}{2}$ gt (T-t) feet

where T = total flight time to complete trajectory, in seconds
t = time to reach desired point in trajectory, in seconds

Wind Deflection

Deflection of bullet caused by wind = v (T-t) feet

where v = wind velocity at right angles to range, in feet per second
T = time of flight to point where deflection is sought, in seconds
t = time of flight to point where deflection is sought, in seconds if bullet travelled in a vacuum.

Note: velocity at one mile per hour equals 1.4667 feet per second

TABLE XVIII

Ballistics of Remington Rimfire Cartridges

			Bullet	Velocity— Ft. Per Second		Energy — Foot-Pounds		Mid-Range Trajectory
	Remington Order No.	Wt. Grs.	Style	Muzzle	100 Yds.	Muzzle	100 Yds.	100 Yds. inches
HYPER VELOCITY 22 CARTRIDGES								
22 Long Rifle "Viper"	1922	36	Truncated Cone, Solid	1410	1056	159	89	3.1
22 Long Rifle "Yellow Jacket"	1722	33	Truncated Cone, Hollow Point	1500	1075	165	85	2.8
"HIGH VELOCITY" 22 CARTRIDGES								
22 Long Rifle	1522 1500†	40	Lead	1255	1017	140	92	3.6
	1622 1600†	36	Hollow Point	1280	1010	131	82	3.5
22 Long	1322	29	Lead	1240	962	99	60	3.9
22 Short	1022	29	Lead	1095	903	77	52	4.5
	1122	27	Hollow Point	1120	904	75	49	4.4
"TARGET" STANDARD VELOCITY 22 CARTRIDGES								
22 Long Rifle	6122 6100†	40	Lead	1150	976	117	85	4.0
22 Short	5522	29	Lead	1045	872	70	49	4.8

†100-pack. All others packed 50 per box.

Interchangeability of Remington Ammunition Cartridges within groups shown are interchangeable. Other substitutions should not be made without specific recommendation of the firearms manufacturer, since improper combinations could result in firearm damage or personal injury.

RIMFIRE
22 W.R.F.
22 Remington Special
22 Win. M/1890 in a 22 Win. Magnum Rimfire but not conversely

CENTERFIRE
25–20 Remington
25–20 W.C.F.
25–20 Win.
25–20 Win. High Speed
25–20 Marlin
25 W.C.F

6mm Rem. (80 & 90 grain)
244 Rem.

25 Automatic
25 Auto. Colt Pistol (ACP)
25 (6.35mm) Automatic Pistol
6.35mm Browning

7mm Express Rem.
280 Rem.

7.65mm Browning (not interchangeable with 7.65mm Luger)

32 Short Colt in 32 Long Colt but not conversely
SEE NOTE C

32 S.&W. in 32 S.&W. Long but not conversely

32 S.&W. Long
32 Colt New Police
32 Colt Police Positive

32 W.C.F.*
32 Win.*
32–20 Win. High Speed*
SEE NOTE A

32–20 Colt L.M.R.
32–20 W.C.F.
32–20 Win. and Marlin
SEE NOTE G

38 Short Colt in 38 Long Colt but not conversely
Both can be used in 38 Special

38 Marlin
38 Win.*
SEE NOTE A

38 Remington*
38–40 Win.
38 W.C.F.*
SEE NOTE A

38 Automatic in 38 Super (+P) but not conversely

380 Automatic
9mm Browning Short (Corto Kurz)

9mm Luger
9mm Parabellum
SEE NOTE E

Continued

TABLE XVIII, Continued

Ballistics of Remington Rimfire Cartridges

30–30 Sav.
30–30 Win.
30–30 Win. "Accelerator"
30–30 Marlin
30–30 Win. High Speed
30 W.C.F.

32 Colt Automatic
32 Auto. Colt Pistol (ACP)
32 (7.6mm) Automatic Pistol
7.65mm Automatic Pistol

38 S.&W.
38 Colt New Police
380 Webley

38 Colt Special
38 S.&W. Special
38 Targetmaster
38 S.&W. Special Mid-Range
38 Special (+P)
38–44 Special (+P)
38 Special
38 Special Flat Point
SEE NOTES B & D

44 S. & W. Special
SEE NOTE F

44 Marlin
44 Win.
44 Remington
44–40 Win.
44 W.C.F.

45–70 Government
45–70 Marlin, Win.
45–70–405

NOTE A:*High-speed cartridges must not be used in revolvers. They should be used only in rifles made especially for them.* ***NOTE B:*** *Ammunition with (+P) on the case headstamp is loaded to higher pressure. Use only in firearms designated for this cartridge and so recommended by the gun manufacturer.* ***NOTE C:*** *Not for use in revolvers chambered for 32 S. & W. or 32 S. & W Long.* ***NOTE D:*** *All 38 Special cartridges can be used in 357 Magnum revolvers but not conversely.* ***NOTE E:*** *9mm sub-machine gun cartridges should not be used in handguns.* ***NOTE F:*** *44 Russian and 44 S. & W. Special can be used in 44 Remington Magnum revolvers but not conversely.* ***NOTE G:*** *Not to be used in Win. M–66 and M–73.*

TABLE XVIII

Ballistics of Remington Pistol & Revolver Cartridges

Remington Ballistics

CALIBER	Order No.	Primer No.	Wt. Grs.	BULLET Style	VELOCITY (FPS) Muzzle	50 Yds.	100 Yds.	ENERGY (FT LB) Muzzle	50 Yds.	100 Yds.	MID-RANGE TRAJECTORY 50 Yds.	100 Yds.	
(1) 22 REM. "JET" MAG.	R22JET	6½	40*	Soft Point	2100	1790	1510	390	285	200	0.3″	1.4″	8⅜″
(2) 221 REM. "FIRE BALL"	R221F	7½″	50*	Pointed Soft Point	2650	2380	2130	780	630	505	0.2″	0.8″	10½″
(3) 25 (6.35mm) AUTO. PISTOL	R25AP	1½	50*	Metal Case	760	707	659	64	56	48	2.0″	8.7″	2″
(4) 32 S. & W.	R32SW	5½	88*	Lead	680	645	610	90	81	73	2.5″	10.5″	3″
(5) 32 S. & W. LONG	R32SWL	1½	98*	Lead	705	670	635	115	98	88	2.3″	10.5″	4″
(6) 32 SHORT COLT	R32SC	1½	80*	Lead	745	665	590	100	79	62	2.2″	9.9″	4″
(7) 32 LONG COLT	R32LC	1½	82*	Lead	755	715	675	100	93	83	2.0″	8.7″	4″
(8) 32 (7.65mm) AUTO. PISTOL	R32AP	1½	71*	Metal Case	905	855	810	129	115	97	1.4″	5.8″	4″
	R357M7	5½	110	Semi-Jacketed H.P.	1295	1094	975	410	292	232	0.8″	3.5″	4″
	R357M1	5½	125	Semi-Jacketed H.P.	1450	1240	1090	583	427	330	0.6″	2.8″	4″
	R357M8	1½	125	Semi-Jacketed H.P.	1450	1240	1090	583	427	330	0.6″	2.8″	4″
(9) 357 MAG.	R357M2	5½	158*	Semi-Jacketed H.P.	1235	1104	1015	535	428	361	0.8″	3.5″	4″
Vented Barrel	R357M3	5½	158	Soft Point	1235	1104	1015	535	428	361	0.8″	3.5″	4″
	R357M4	5½	158	Metal Point	1235	1104	1015	535	428	361	0.8″	3.5″	4″
	R357M5	5½	158	Lead	1235	1104	1015	535	428	361	0.8″	3.5″	4″
	R357M6	5½	158	Lead (Brass Case)	1235	1104	1015	535	428	361	0.8″	3.5″	4″
(10) 357 REM. "MAXIMUM"**	357MXI	7½	158*	Semi-Jacketed H.P.	1825	1588	1381	1168	885	669	0.4″	1.7″	10½″
(11) 9mm LUGER	R9MM1	1½	115*	Jacketed H.P.	1155	1047	971	341	280	241	0.9″	3.9″	4″
AUTO. PISTOL	R9MM2	1½	124	Metal Case	1110	1030	971	339	292	259	1.0″	4.1″	4″
(12) 380 AUTO. PISTOL	R380AP	1½	95	Metal Case	955	865	785	190	160	130	1.4″	5.9″	4″
	R380A1	1½	88*	Jacketed H.P.	990	920	868	191	165	146	1.2″	5.1″	4″
(13) 38 AUTO. COLT PISTOL	R38ACP	1½	130*	Metal Case	1040	980	925	310	275	245	1.0″	4.7″	4½″
(14) 38 SUPER AUTO.	R38SU1	1½	115*	Jacketed H.P. (+P)†	1300	1147	1041	431	336	277	0.7″	3.3″	5″
COLT PISTOL	R38SUP	1½	130	Metal Case (+P)†	1215	1099	1017	426	348	298	0.8″	3.6″	5″
(15) 38 S. & W.	R38SW	1½	146*	Lead	685	650	620	150	135	125	2.4″	10.0″	4″
	R38S1	1½	95	Semi-Jacketed H.P. (+P)†	1175	1044	959	291	230	194	0.9″	3.9″	4″
	R38S10	1½	110	Semi-Jacketed H.P. (+P)†	995	926	871	242	210	185	1.2″	5.1″	4″
	R38S2	1½	125	Semi-Jacketed H.P. (+P)†	945	898	858	248	224	204	1.3″	5.4″	4″
	R38S3	1½	148	"Targetmaster" Lead W.C.	710	634	566	166	132	105	2.4″	10.8″	4″
(16) 38 SPECIAL	R38S4	1½	158	"Targetmaster" Lead	755	723	692	200	183	168	2.0″	8.3″	4″
Vented Barrel	R38S5	1½	158*	Lead (Round Nose)	755	723	692	200	183	168	2.0″	8.3″	4″
	R38S6	1½	158	Semi-Wadcutter	755	723	692	200	183	168	2.0″	8.3″	4″
	R38S7	1½	158	Metal Point	755	723	692	200	183	168	2.0″	8.3″	4″
	R38S8	1½	158	Lead (+P)†	890	855	823	278	257	238	1.4″	6.0″	4″
	R38S12	1½	158	Lead H.P. (+P)†	890	855	823	278	257	238	1.4″	6.0″	4″
	R38S9	1½	200	Lead	635	614	594	179	168	157	2.8″	11.5″	4″
(17) 38 SHORT COLT	R38SC	1½	125*	Lead	730	685	645	150	130	115	2.2″	9.4″	6″
(18) 41 REM. MAG.	R41MG1	2½	210*	Soft Point	1300	1162	1062	788	630	526	0.7″	3.2″	4″
Vented Barrel	R41MG2	2½	210	Lead	965	898	842	434	376	331	1.3″	5.4″	4″
	R44MG5	2½	180*	Semi-Jacketed H.P.	1610	1365	1175	1036	745	551	0.5″	2.3″	4″
(19) 44 REM. MAG.	R44MG1	2½	240	Lead Gas Check	1350	1186	1069	971	749	608	0.7″	3.1″	4″
Vented Barrel	R44MG2	2½	240	Soft Point	1180	1081	1010	741	623	543	0.9″	3.7″	4″
	R44MG3	2½	240	Semi-Jacketed H.P.	1180	1081	1010	741	623	543	0.9″	3.7″	4″
	R44MG4	2½	240	Lead (Med. Vel.)	1000	947	902	533	477	433	1.1″	4.8″	6½″
(20) 44 S. & W. SPECIAL	R44SW	2½	246*	Lead	755	725	695	310	285	265	2.0″	8.3″	6½″
(21) 45 COLT	R45C	2½	250*	Lead	860	820	780	410	375	340	1.6″	6.6″	5½″
(22) 45 AUTO.	R45AP1	2½	185	Metal Case Wadcutter	770	707	650	244	205	174	2.0″	8.7″	5″
	R45AP2	2½	185*	Jacketed H.P.	940	890	846	363	325	294	1.3″	5.5″	5″
	R45AP4	2½	230	Metal Case	810	776	745	335	308	284	1.7″	7.2″	5″
(23) 45 AUTO. RIM	R45AR	2½	230*	Lead	810	770	730	335	305	270	1.8″	7.4″	5½″
38 S. & W.	R38SWBL	1½	—	Blank	—	—	—	—	—	—	—	—	—
32 S. & W.	R32BLNK	5½	—	Blank	—	—	—	—	—	—	—	—	—
38 SPECIAL	R38BLNK	1½	—	Blank	—	—	—	—	—	—	—	—	—

† Ammunition with (+P) on the case headstamp is loaded to higher pressure. Use only in firearms designated for this cartridge and so recommended by the gun manufacturer.

** Illustrated (not shown in actual size). ** Will not chamber in 357 Mag. or 38 Special handguns.*

TABLE XVIII

Ballistics of Remington Centerfire Rifle Cartridges

Remington Ballistics

CALIBERS	REMINGTON Order No.	BULLET Wt.*Grs.	BULLET Style	Primer No.	VELOCITY FEET PER SECOND Muzzle	100 Yds	200 Yds.	300 Yds.	400 Yds.	500 Yds.
17 REM.	R17REM	25*	Hollow Point Power-Lokt®	7½	4040	3284	2644	2086	1606	1235
22 HORNET	R22HN1	45*	Pointed Soft Point	6½	2690	2042	1502	1128	948	840
	R22HN2	45	Hollow Point	6½	2690	2042	1502	1128	948	840
222 REM.	R222R1	50	Pointed Soft Point	7½	3150	2602	2123	1700	1350	1107
	R222R3	50*	Hollow Point Power-Lokt	7½	3140	2635	2182	1777	1432	1172
	R222R4	55	Metal Case	7½	3020	2562	2147	1773	1451	1201
222 REM. MAG.	R222M1	55*	Pointed Soft Point	7½	3240	2748	2305	1906	1556	1272
	R222M2	55	Hollow Point Power-Lokt	7½	3240	2773	2352	1969	1627	1341
223 REM.	R223R1	55	Pointed Soft Point	7½	3240	2747	2304	1905	1554	1270
	R223R2	55*	Hollow Point Power-Lokt	7½	3240	2773	2352	1969	1627	1341
	R223R3	55	Metal Case	7½	3240	2759	2326	1933	1587	1301
22–250 REM.	R22501	55*	Pointed Soft Point	9½	3680	3137	2656	2222	1832	1493
	R22502	55	Hollow Point Power-Lokt	9½	3680	3209	2785	2400	2046	1725
243 WIN.	R243W1	80	Pointed Soft Point	9½	3350	2955	2593	2259	1951	1670
	R243W2	80*	Hollow Point Power-Lokt	9½	3350	2955	2593	2259	1951	1670
	R243W3	100	Pointed Soft Point Core-Lokt®	9½	2960	2697	2449	2215	1993	1786
6mm REM.	R6MM1	80**	Pointed Soft Point	9½	3470	3064	2694	2352	2036	1747
	R6MM2	80**	Hollow Point Power-Lokt	9½	3470	3064	2694	2352	2036	1747
	R6MM4	100*	Pointed Soft Point Core-Lokt	9½	3100	2829	2573	2332	2104	1889
25–20 WIN.	R25202	86*	Soft Point	6½	1460	1194	1030	931	858	797
250 SAV.	R250SV	100*	Pointed Soft Point	9½	2820	2504	2210	1936	1684	1461
257 ROBERTS	R257	117*	Soft Point Core-Lokt	9½	2650	2291	1961	1663	1404	1199
25–06 REM.	R25061	87	Hollow Point Power-Lokt	9½	3440	2995	2591	2222	1884	1583
	R25062	100*	Pointed Soft Point Core-Lokt	9½	3230	2893	2580	2287	2014	1762
	R25063	120	Pointed Soft Point Core-Lokt	9½	2990	2730	2484	2252	2032	1825
6.5mm REM. MAG.	R65MM2	120*	Pointed Soft Point Core-Lokt	9½M	3210	2905	2621	2353	2102	1867
264 WIN. MAG	R264W2	140*	Pointed Soft Point Core-Lokt	9½M	3030	2782	2548	2326	2114	1914
270 WIN.	R270W1	100	Pointed Soft Point	9½	3430	3021	2649	2305	1988	1699
	R270W2	130*	Pointed Soft Point Core-Lokt	9½	3060	2776	2510	2259	2022	1801
	R270W3	130	Bronze Point	9½	3060	2802	2559	2329	2110	1904
	R270W4	150	Soft Point Core-Lokt	9½	2850	2504	2183	1886	1618	1385
7mm MAUSER	R7MSR1	140*	Pointed Soft Point	9½	2660	2435	2221	2018	1827	1648
7mm–08 REM.	R7M081	140*	Pointed Soft Point	9½	2860	2625	2402	2189	1988	1798
280 REM.††	R280R1	150*	Pointed Soft Point Core-Lokt	9½	2970	2699	2444	2203	1975	1763
	R280R2	165*	Soft Point Core-Lokt	9½	2820	2510	2220	1950	1701	1479
7mm REM. MAG.	R7MM2	150*	Pointed Soft Point Core-Lokt	9½M	3110	2830	2568	2320	2085	1866
	R7MM3	175	Pointed Soft Point Core-Lokt	9½M	2860	2645	2440	2244	2057	1879
30 CARBINE	R30CAR	110*	Soft Point	6½	1990	1567	1236	1035	923	842
30 REM.	R30REM	170*	Soft Point Core-Lokt	9½	2120	1822	1555	1328	1153	1036
30–30 WIN. "ACCELERATOR"	R3030A	55*	Soft Point	9½	3400	2693	2085	1570	1187	986
30–30 WIN.	R30301	150*	Soft Point Core-Lokt	9½	2390	1973	1605	1303	1095	974
	R30302	170	Soft Point Core-Lokt	9½	2200	1895	1619	1381	1191	1061
	R30303	170	Hollow Point Core-Lokt	9½	2200	1895	1619	1381	1191	1061

TABLE XVIII, Continued

ENERGY FOOT-POUNDS						TRAJECTORY† 0.0 indicates yardage at which rifle was sighted in. SHORT RANGE Bullet does not rise more than one inch above line of sight from muzzle to sighting-in range.						LONG RANGE Bullet does not rise more than three inches above line of sight from muzzle to sighting-in range.						BARREL LENGTH
Muzzle	100 Yds.	200 Yds.	300 Yds.	400 Yds.	500 Yds.	50 Yds.	100 Yds.	150 Yds.	200 Yds.	250 Yds.	300 Yds.	100 Yds.	150 Yds.	200 Yds.	250 Yds.	300 Yds.	400 Yds.	500 Yds.	
906	599	388	242	143	85	0.1	0.5	0.0	−1.5	−4.2	−8.5	2.1	2.5	1.9	0.0	−3.4	−17.0	−44.3	24″
723	417	225	127	90	70	0.3	0.0	−2.4	−7.7	−16.9	−31.3	1.6	0.0	−4.5	−12.8	−26.4	−75.6	−163.4	24″
723	417	225	127	90	70	0.3	0.0	−2.4	−7.7	−16.9	−31.3	1.6	0.0	−4.5	−12.8	−26.4	−75.6	−163.4	
1094	752	500	321	202	136	0.5	0.9	0.0	−2.5	−6.9	−13.7	2.2	1.9	0.0	−3.8	−10.0	−32.3	−73.8	
1094	771	529	351	228	152	0.5	0.9	0.0	−2.4	−6.6	−13.1	2.1	1.8	0.0	−3.6	−9.5	−30.2	−68.1	24″
1114	801	563	384	257	176	0.6	1.0	0.0	−2.5	−7.0	−13.7	2.2	1.9	0.0	−3.8	−9.9	−31.0	−68.7	
1282	922	649	444	296	198	0.4	0.8	0.0	−2.2	−6.0	−11.8	1.9	1.6	0.0	−3.3	−8.5	−26.7	−59.5	24″
1282	939	675	473	323	220	0.4	0.8	0.0	−2.1	−5.8	−11.4	1.8	1.6	0.0	−3.2	−8.2	−25.5	−56.0	
1282	921	648	443	295	197	0.4	0.8	0.0	−2.2	−6.0	−11.8	1.9	1.6	0.0	−3.3	−8.5	−26.7	−59.6	
1282	939	675	473	323	220	0.4	0.8	0.0	−2.1	−5.8	−11.4	1.8	1.6	0.0	−3.2	−8.2	−25.5	−56.0	24″
1282	929	660	456	307	207	0.4	0.8	0.0	−2.1	−5.9	−11.6	1.9	1.6	0.0	−3.2	−8.4	−26.2	−57.9	
1654	1201	861	603	410	272	0.2	0.5	0.0	−1.6	−4.4	−8.7	2.3	2.6	1.9	0.0	−3.4	−15.9	−38.9	24″
1654	1257	947	703	511	363	0.2	0.5	0.0	−1.5	−4.1	−8.0	2.1	2.5	1.8	0.0	−3.1	−14.1	−33.4	
1993	1551	1194	906	676	495	0.3	0.7	0.0	−1.8	−4.9	−9.4	2.6	2.9	2.1	0.0	−3.6	−16.2	−37.9	
1993	1551	1194	906	676	495	0.3	0.7	0.0	−1.8	−4.9	−9.4	2.6	2.9	2.1	0.0	−3.6	−16.2	−37.9	24″
1945	1615	1332	1089	882	708	0.5	0.9	0.0	−2.2	−5.8	−11.0	1.9	1.6	0.0	−3.1	−7.8	−22.6	−46.3	
2139	1667	1289	982	736	542	0.3	0.6	0.0	−1.6	−4.5	−8.7	2.4	2.7	1.9	0.0	−3.3	−14.9	−35.0	
2139	1667	1289	982	736	542	0.3	0.6	0.0	−1.6	−4.5	−8.7	2.4	2.7	1.9	0.0	−3.3	−14.9	−35.0	24″
2133	1777	1470	1207	983	792	0.4	0.8	0.0	−1.9	−5.2	−9.9	1.7	1.5	0.0	−2.8	−7.0	−20.4	−41.7	
407	272	203	165	141	121	0.0	−4.1	−14.4	−31.8	−57.3	−92.0	0.0	−8.2	−23.5	−47.0	−79.6	−175.9	−319.4	24″
1765	1392	1084	832	630	474	0.2	0.0	−1.6	−4.7	−9.6	−16.5	2.3	2.0	0.0	−3.7	−9.5	−28.3	−59.5	24″
1824	1363	999	718	512	373	0.3	0.0	−1.9	−5.8	−11.9	−20.7	2.9	2.4	0.0	−4.7	−12.0	−36.7	−79.2	24″
2286	1733	1297	954	686	484	0.3	0.6	0.0	−1.7	−4.8	−9.3	2.5	2.9	2.1	0.0	−3.6	−16.4	−39.1	
2316	1858	1478	1161	901	689	0.4	0.7	0.0	−1.9	−5.0	−9.7	1.6	1.4	0.0	−2.7	−6.9	−20.5	−42.7	24″
2382	1985	1644	1351	1100	887	0.5	0.8	0.0	−2.1	−5.6	−10.7	1.9	1.6	0.0	−3.0	−7.5	−22.0	−44.8	
2745	2248	1830	1475	1177	929	0.4	0.7	0.0	−1.8	−4.9	−9.5	2.7	3.0	2.1	0.0	−3.5	−15.5	−35.3	24″
2854	2406	2018	1682	1389	1139	0.5	0.8	0.0	−2.0	−5.4	−10.2	1.8	1.5	0.0	−2.9	−7.2	−20.8	−42.2	24″
2612	2027	1557	1179	877	641	0.3	0.6	0.0	−1.7	−4.6	−9.0	2.5	2.8	2.0	0.0	−3.4	−15.5	−36.4	
2702	2225	1818	1472	1180	936	0.5	0.8	0.0	−2.0	−5.5	−10.4	1.8	1.5	0.0	−2.9	−7.4	−21.6	−44.3	24″
2702	2267	1890	1565	1285	1046	0.4	0.8	0.0	−2.0	−5.3	−10.1	1.8	1.5	0.0	−2.8	−7.1	−20.6	−42.0	
2705	2087	1587	1185	872	639	0.7	1.0	0.0	−2.6	−7.1	−13.6	2.3	2.0	0.0	−3.8	−9.7	−29.2	−62.2	
2199	1843	1533	1266	1037	844	0.2	0.0	−1.7	−5.0	−10.0	−17.0	2.5	2.0	0.0	−3.8	−9.6	−27.7	−56.3	24″
2542	2142	1793	1490	1228	1005	0.6	0.9	0.0	−2.3	−6.1	−11.6	2.1	1.7	0.0	−3.2	−8.1	−23.5	−47.7	24″
2937	2426	1989	1616	1299	1035	0.5	0.9	0.0	−2.2	−5.8	−11.0	1.9	1.6	0.0	−3.1	−7.8	−22.8	−46.7	24″
2913	2308	1805	1393	1060	801	0.2	0.0	−1.5	−4.6	−9.5	−16.4	2.3	1.9	0.0	−3.7	−9.4	−28.1	−58.8	
3221	2667	2196	1792	1448	1160	0.4	0.8	0.0	−1.9	−5.2	−9.9	1.7	1.5	0.0	−2.8	−7.0	−20.5	−42.1	24″
3178	2718	2313	1956	1644	1372	0.6	0.9	0.0	−2.3	−6.0	−11.3	2.0	1.7	0.0	−3.2	−7.9	−22.7	−45.8	
967	600	373	262	208	173	0.9	0.0	−4.5	−13.5	−28.3	−49.9	0.0	−4.5	−13.5	−28.3	−49.9	−118.6	−228.2	20″
1696	1253	913	666	502	405	0.7	0.0	−3.3	−9.7	−19.6	−33.8	2.2	0.0	−5.3	−14.1	−27.2	−69.0	−136.9	24″
1412	886	521	301	172	119	0.4	0.8	0.0	−2.4	−6.7	−13.8	2.0	1.8	0.0	−3.8	−10.2	−35.0	−84.4	24″
1902	1296	858	565	399	316	0.5	0.0	−2.7	−8.2	−17.0	−30.0	1.8	0.0	−4.6	−12.5	−24.6	−65.3	−134.9	
1827	1355	989	720	535	425	0.6	0.0	−3.0	−8.9	−18.0	−31.1	2.0	0.0	−4.8	−13.0	−25.1	−63.6	−126.7	24″
1827	1355	989	720	535	425	0.6	0.0	−3.0	−8.9	−18.0	−31.1	2.0	0.0	−4.8	−13.0	−25.1	−63.6	−126.7	

TABLE XVIII

Ballistics of Remington Centerfire Rifle Cartridges, continued.

Remington Ballistics

CALIBERS	BULLET REMINGTON Order No.	Wts.–Grs.	Style	Primer No.	VELOCITY FEET PER SECOND Muzzle	100 Yds.	200 Yds.	300 Yds.	400 Yds.	500 Yds.
300 SAVAGE	R30SV3	180	Soft Point Core-Lokt	9½	2350	2025	1728	1467	1252	1098
	R30SV4	180*	Pointed Soft Point Core-Lokt	9½	2350	2137	1935	1745	1570	1413
30–40 KRAG	R30402	180*	Pointed Soft Point Core-Lokt	9½	2430	2213	2007	1813	1632	1468
308 WIN. "ACCELERATOR"	R308W5	55*	Pointed Soft Point	9½	3770	3215	2726	2286	1888	1541
308 WIN.	R308W1	150*	Pointed Soft Point Core-Lokt	9½	2820	2533	2263	2009	1774	1560
	R308W2	180	Soft Point Core-Lokt	9½	2620	2274	1955	1666	1414	1212
	R308W3	180	Pointed Soft Point Core-Lokt	9½	2620	2393	2178	1974	1782	1604
30–06 "ACCELERATOR"	R30069	55*	Pointed Soft Point	9½	4080	3485	2965	2502	2083	1709
30–06 SPRINGFIELD	R30061	125	Pointed Soft Point	9½	3140	2780	2447	2138	1853	1595
	R30062	150	Pointed Soft Point Core-Lokt	9½	2910	2617	2342	2083	1843	1622
	R30063	150	Bronze Point	9½	2910	2656	2416	2189	1974	1773
	R3006B	165*	Pointed Soft Point Core-Lokt	9½	2800	2534	2283	2047	1825	1621
	R30064	180	Soft Point Core-Lokt	9½	2700	2348	2023	1727	1466	1251
	R30065	180	Pointed Soft Point Core-Lokt	9½	2700	2469	2250	2042	1846	1663
	R30066	180	Bronze Point	9½	2700	2485	2280	2084	1899	1725
	R30067	220	Soft Point Core-Lokt	9½	2410	2130	1870	1632	1422	1246
300 H. & H. MAG.	R300HH	180*	Pointed Soft Point Core-Lokt	9½M	2880	2640	2412	2196	1990	1798
300 WIN. MAG.	R300W1	150	Pointed Soft Point Core-Lokt	9½M	3290	2951	2636	2342	2068	1813
	R300W2	180*	Pointed Soft Point Core-Lokt	9½M	2960	2745	2540	2344	2157	1979
303 BRITISH	R303B1	180*	Soft Point Core-Lokt	9½	2460	2124	1817	1542	1311	1137
32–20 WIN.	R32201	100	Lead	6½	1210	1021	913	834	769	712
	R32202	100*	Soft Point	6½	1210	1021	913	834	769	712
32 WIN. SPECIAL	R32WS2	170*	Soft Point Core-Lokt	9½	2250	1921	1626	1372	1175	1044
8mm MAUSER	R8MSR	170*	Soft Point Core-Lokt	9½	2360	1969	1622	1333	1123	997
8mm REM. MAG	R8MM1	185*	Pointed Soft Point Core-Lokt	9½M	3080	2761	2464	2186	1927	1688
	R8MM2	220	Pointed Soft Point Core-Lokt	9½M	2830	2581	2346	2123	1913	1716
35 REM.	R35R1	150	Pointed Soft Point Core-Lokt	9½	2300	1874	1506	1218	1039	934
	R35R2	200*	Soft Point Core-Lokt	9½	2080	1698	1376	1140	1001	911
350 REM. MAG.	R350M1	200*	Pointed Soft Point Core-Lokt	9½M	2710	2410	2130	1870	1631	1421
375 H. & H. MAG.	R375M1	270*	Soft Point	9½M	2690	2420	2166	1928	1707	1507
	R375M2	300	Metal Case	9½M	2530	2171	1843	1551	1307	1126
44–40 WIN.	R4440W	200*	Soft Point	2½	1190	1006	900	822	756	699
44 REM. MAG.	R44MG2	240	Soft Point	2½	1760	1380	1114	970	878	806
	R44MG3	240	Semi-Jacketed Hollow Point	2½	1760	1380	1114	970	878	806
444 MAR.	R444M	240	Soft Point	9½	2350	1815	1377	1087	941	846
	R444M2	265*	Soft Point	9½	2120	1733	1405	1160	1012	920
45–70 GOVERNMENT	R4570G	405*	Soft Point	9½	1330	1168	1055	977	918	869
458 WIN. MAG.	R458W1	500	Metal Case	9½M	2040	1823	1623	1442	1237	1161
	R458W2	510*	Soft Point	9½M	2040	1770	1527	1319	1157	1046

TABLE XVIII, Continued

TRAJECTORY† 0.0 Indicates yardage at which rifle was sighted in.

ENERGY FOOT-POUNDS						SHORT RANGE Bullet does not rise more than one inch above line of sight from muzzle to sighting-in range.						LONG RANGE Bullet does not rise more than three inches above line of sight from muzzle to sighting-in range.						
Muzzle	100 Yds.	200 Yds.	300 Yds.	400 Yds.	500 Yds.	50 Yds.	100 Yds.	150 Yds.	200 Yds.	250 Yds.	300 Yds.	100 Yds.	150 Yds.	200 Yds.	250 Yds.	300 Yds.	400 Yds.	500 Yds.	
2207	1639	1193	860	626	482	0.5	0.0	−2.6	−7.7	−15.6	−27.1	1.7	0.0	−4.2	−11.3	−21.9	−55.8	−112.0	24″
2207	1825	1496	1217	985	789	0.4	0.0	−2.3	−6.7	−13.5	−22.8	1.5	0.0	−3.6	−9.6	−18.2	−44.1	−84.2	
2360	1957	1610	1314	1064	861	0.4	0.0	−2.1	−6.2	−12.5	−21.1	1.4	0.0	−3.4	−8.9	−16.8	−40.9	−78.1	24″
1735	1262	907	638	435	290	0.2	0.5	0.0	−1.5	−4.2	−8.2	2.2	2.5	1.8	0.0	−3.2	−15.0	−36.7	24″
2648	2137	1705	1344	1048	810	0.2	0.0	−1.5	−4.5	−9.3	−15.9	2.3	1.9	0.0	−3.6	−9.1	−26.9	−55.7	
2743	2066	1527	1109	799	587	0.3	0.0	−2.0	−5.9	−12.1	−20.9	2.9	2.4	0.0	−4.7	−12.1	−36.9	−79.1	24″
2743	2288	1896	1557	1269	1028	0.2	0.0	−1.8	−5.2	−10.4	−17.7	2.6	2.1	0.0	−4.0	−9.9	−28.9	−58.8	
2033	1483	1074	764	530	356	0.4	1.0	0.9	0.0	−1.9	−5.0	1.8	2.1	1.5	0.0	−2.7	−12.5	−30.5	24″
2736	2145	1662	1269	953	706	0.4	0.8	0.0	−2.1	−5.6	−10.7	1.8	1.5	0.0	−3.0	−7.7	−23.0	−48.5	
2820	2281	1827	1445	1131	876	0.6	0.9	0.0	−2.3	−6.3	−12.0	2.1	1.8	0.0	−3.3	−8.5	−25.0	−51.8	
2820	2349	1944	1596	1298	1047	0.6	0.9	0.0	−2.2	−6.0	−11.4	2.0	1.7	0.0	−3.2	−8.0	−23.3	−47.5	
2872	2352	1909	1534	1220	963	0.7	1.0	0.0	−2.5	−6.7	−12.7	2.3	1.9	0.0	−3.6	−9.0	−26.3	−54.1	24″
2913	2203	1635	1192	859	625	0.2	0.0	−1.8	−5.5	−11.2	−19.5	2.7	2.3	0.0	−4.4	−11.3	−34.4	−73.7	
2913	2436	2023	1666	1362	1105	0.2	0.0	−1.6	−4.8	−9.7	−16.5	2.4	2.0	0.0	−3.7	−9.3	−27.0	−54.9	
2913	2468	2077	1736	1441	1189	0.2	0.0	−1.6	−4.7	−9.6	−16.2	2.4	2.0	0.0	−3.6	−9.1	−26.2	−53.0	
2837	2216	1708	1301	988	758	0.4	0.0	−2.3	−6.8	−13.8	−23.6	1.5	0.0	−3.7	−9.9	−19.0	−47.4	−93.1	
3315	2785	2325	1927	1583	1292	0.6	0.9	0.0	−2.3	−6.0	−11.5	2.1	1.7	0.0	−3.2	−8.0	−23.3	−47.4	24″
3605	2900	2314	1827	1424	1095	0.3	0.7	0.0	−1.8	−4.8	−9.3	2.6	2.9	2.1	0.0	−3.5	−15.4	−35.5	24″
3501	3011	2578	2196	1859	1565	0.5	0.8	0.0	−2.1	−5.5	−10.4	1.9	1.6	0.0	−2.9	−7.3	−20.9	−41.9	
2418	1803	1319	950	687	517	0.4	0.0	−2.3	−6.9	−14.1	−24.4	1.5	0.0	−3.8	−10.2	−19.8	−50.5	−101.5	24″
325	231	185	154	131	113	0.0	−6.3	−20.9	−44.9	−79.3	−125.1	0.0	−11.5	−32.3	−63.8	−106.3	−230.3	−413.3	24″
325	231	185	154	131	113	0.0	−6.3	−20.9	−44.9	−79.3	−125.1	0.0	−11.5	−32.3	−63.6	−106.3	−230.3	−413.3	
1911	1393	998	710	521	411	0.6	0.0	−2.9	−8.6	−17.6	−30.5	1.9	0.0	−4.7	−12.7	−24.7	−63.2	−126.9	24″
2102	1463	993	671	476	375	0.5	0.0	−2.7	−8.2	−17.0	−29.8	1.8	0.0	−4.5	−12.4	−24.3	−63.8	−130.7	24″
3896	3131	2494	1963	1525	1170	0.5	0.8	0.0	−2.1	−5.6	−10.7	1.8	1.6	0.0	−3.0	−7.6	−22.5	−46.8	24″
3912	3254	2688	2201	1787	1438	0.6	1.0	0.0	−2.4	−6.4	−12.1	2.2	1.8	0.0	−3.4	−8.5	−24.7	−50.5	
1762	1169	755	494	359	291	0.6	0.0	−3.0	−9.2	−19.1	−33.9	2.0	0.0	−5.1	−14.1	−27.8	−74.0	−152.3	24″
1921	1280	841	577	445	369	0.8	0.0	−3.8	−11.3	−23.5	−41.2	2.5	0.0	−6.3	−17.1	−33.6	−87.7	−176.4	
3261	2579	2014	1553	1181	897	0.2	0.0	−1.7	−5.1	−10.4	−17.9	2.6	2.1	0.0	−4.0	−10.3	−30.5	−64.0	20″
4337	3510	2812	2228	1747	1361	0.2	0.0	−1.7	−5.1	−10.3	−17.6	2.5	2.1	0.0	−3.9	−10.0	−29.4	−60.7	24″
4263	3139	2262	1602	1138	844	0.3	0.0	−2.2	−6.5	−13.5	−23.4	1.5	0.0	−3.6	−9.8	−19.1	−49.1	−99.5	
629	449	360	300	254	217	0.0	−6.5	−21.6	−46.3	−81.8	−129.1	0.0	11.8	−33.3	−65.5	−109.5	−237.4	−426.2	24″
1650	1015	661	501	411	346	0.0	−2.7	−10.0	−23.0	−43.0	−71.2	0.0	−5.9	−17.6	−36.3	−63.1	−145.5	−273.0	20″
1650	1015	661	501	411	346	0.0	−2.7	−10.0	−23.0	−43.0	−71.2	0.0	−5.9	−17.6	−36.3	−63.1	−145.5	−273.0	
2942	1755	1010	630	472	381	0.6	0.0	−3.2	−9.9	−21.3	−38.5	2.1	0.0	−5.6	−15.9	−32.1	−87.8	−182.7	24″
2644	1768	1162	791	603	498	0.7	0.0	−3.6	−10.8	−22.5	−39.5	2.4	0.0	−6.0	−16.4	−32.2	−84.3	−170.2	
1590	1227	1001	858	758	679	0.0	−4.7	−15.8	−34.0	−60.0	−94.5	0.0	−8.7	−24.6	−48.2	−80.3	−172.4	−305.9	24″
4620	3689	2924	2308	1839	1469	0.7	0.0	−3.3	−9.6	−19.2	−32.5	2.2	0.0	−5.2	−13.6	−25.8	−63.2	−121.7	24″
4712	3547	2640	1970	1516	1239	0.8	0.0	−3.5	−10.3	−20.8	−35.6	2.4	0.0	−5.6	−14.9	−28.5	−71.5	−140.4	

TABLE XVIII

Remington Shotshell Ammunition

REMINGTON & PETERS TARGET AMMUNITION with "Power Piston" wads

Gauge/ Bore	Load Type	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes	Remington Order No.	Peters Order No.
		2¾"	3	1⅛	7½,8,9		PT12M
12	Peters Target	2¾"	2¾	1⅛	7½,8,9		PT12L
		2¾"	—	1	8		PT12L8-1
20	"RXP"Skeet	2¾"	2½	⅞	9	XR20	XP20
28	Skeet	2¾"	2	¾	9	SP28	PS28
.410	Skeet†	2½"	Max.	½	9	SP410	PS410
12	Int'l Trap	2¾"	3¼	1⅛	7½‡	NSP12H	—
	Int'l Trap	2¾"	3¼	1⅛	7½,8	SP12H	—

†Uses a special shot container. *‡Nickel.*

"SHURSHOT" FIELD LOADS

These shotshells are a sure bet for all kinds of upland game. Because "ShurShot" loads have up to ⅛ oz. more shot than so-called "promo" loads, you get up to 50 more pellets in every pattern.

Order Number	Gauge	Shell Length	Powder Dr.Eq.	Ounces of Shot	Shot Sizes
R12H	12	2¾"	3¼	1⅛	4,5,6, 9
R12H250CS†	12	2¾"	3¼	1⅛	7½,8
R16H	16	2¾"	2¾	1⅛	4, 6,7½,8,9
R20M	20	2½"	2½	1	4,5,6, 9
R20M250CS†	20	2¾"	2½	1	7½,8

Packed 25 round per box, 250 rounds per case.

"EXPRESS" EXTRA LONG RANGE

For consistent performance in a variety of field conditions, more hunters take the "Express." These high-base loads have "Power Piston" wads for uniform, game-getting patterns at longer rangers.

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes
SP10	10	2⅞"	4¾	1⅝	4
SP12	12	2¾"	3¾	1¼	BB,2,4,5,6,7½,9
SP16	16	2¾"	3¼	1⅛	4,5,6,7½,9
SP20	20	2¾"	2¾	1	4,5,6,7½,9
SP28	28	2¾"	2¼	¾	6,7½
SP410	.410	2½"	Max.	½	4, 6,7½
SP4103	.410	3"	Max.	11/16	4,5,6,7½,9

"EXPRESS" BUCKSHOT LOADS

These "Power-Pakt" loads feature granulated poly filler and "Power Piston" wads to cushion the pellets, minimize distortion, improve patterns. In convenient 5-packs.

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Buckshot Size	Pellet Count
SP12BK-5PK	12	2¾"	3¾	000	8
SP12BK-5PK	12	2¾"	3¾	00	9
SP12BK-5PK	12	2¾"	3¾	0	12
SP12BK-5PK	12	2¾"	3¾	1	16
SP12BK-5PK	12	2¾"	3¾	4	27
SP16BK-5PK	16	2¾"	3	1	12
SP20BK-5PK	20	2¾"	2¾	3	20
SP12S Mag. BK-5PK	12	2¾"	4	00	12
SP12S Mag. BK-5PK	12	2¾"	4	1	20
SP12H Mag. BK-5PK	12	3"	4	000	10
SP12H Mag. BK-5PK	12	3"	4	00	15
SP12H Mag. BK-5PK	12	3"	Max.	1	24
SP12H Mag. Bk-5PK	12	3"	4	4	41

"SLUGGER" RIFLED SLUGS

These slugs have hollow points and built-in solid downrange performance. Hollow points in 12, 16, 20 ga.; standard round nose in .410.

Order Number	Gauge	Shell	Slug Wt. (oz.)	Velocity (fps) Muz.	Velocity (fps) 50 Yds	Energy-FP Muz.	Energy-FP 50 Yds
SP12RS-5PK	12	2¾"HP	1	1560	1175	2364	1342
SP16RS-5PK	16	2¾"HP	⅘	1600	1175	1990	1075
SP20RS-5PK	20	2¾"HP	⅝	1580	1240	1515	934
SP410RS-5PK	.410	2½"	⅕	1830	1335	650	345

TABLE XVIII, Continued

"Premier" Extended Range Buffered Magnums

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes
PR12S Mag.	12	2¾"	Max.	1½	BB,2,4,6
PR12 Mag.	12	3"	4	1⅝	4,6
PR12H Mag.	12	3"	Max.	1⅞	BB,2,4
PR20S Mag.	20	2¾"	Max.	1⅛	4,6
PR20H Mag.	20	3"	Max.	1¼	2,4,6

"Premier" Extra Long Range Shotshells

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes
PR12	12	2¾"	3¾	1¼	2,4,6,7½
PR20	20	2¾"	2¾	1	4,6

"Premier" "Power Pattern" Field Loads

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes
PR12F	12	2¾"	3¼	1⅛	7½,8
PR12HF	12	2¾"	3¼	1¼	7½,8
PR20F	20	2¾"	2½	1	7½,8

All packed 25 rounds per box, 250 rounds per case.

STEEL-SHOT WATERFOWL LOADS

When steel shot's a must, these 12-ga. loads can help you bring down more birds. They'll reliably operate all autoloading shotguns and provide retained pellet energy comparable to that of traditional lead-shot loads.

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes
STL12	12	2¾"	Max.	1⅛	1,2,4
STL12 Mag.	12	3"	Max.	1¼	1,2,4

"EXPRESS" MAGNUMS

For tough waterfowl-and turkey-hunting situations, these 10- and 16-ga. magnums give you the extra game-power you need. They're the most powerful non-buffered shotshells we make.

Order Number	Gauge	Shell Length	Powder Dr.Eq.	Ounces of Shot	Shot Sizes
SP10 Mag.	10	3½"	Max.	2	BB,2,4
SP16C Mag.	16	2¾"	Max.	1¼	2,4,6

Packed 25 rounds per box, 250 rounds per case.

"NITRO MAGNUM" BUFFERED MAGNUM

New last year, these loads combine a controlled distribution of granulation poly filler with our patented "Power Piston" one-piece wad to cushion and protect the extra-hard lead shot. To give you tighter game-getting patterns at distances well beyond those of ordinary mags.

Order Number	Gauge	Shell Length	Powder Dr. Eq.	Ounces of Shot	Shot Sizes
SP12SNM	12	2¾"	Max.	1½	BB,2,4,5,6
SP12NM	12	3"	4	1⅝	2,4, 6
SP12HNM	12	3"	Max.	1⅞	BB,2,4,
SP20SNM	20	2¾"	Max.	1⅛	4, 6,7½
SP20HNM	20	3"	Max.	1¼	2,4, 6,7½

Packed 25 rounds per box, 250 rounds per case.

TABLE XVIII

Ballistics of Winchester Ammunition

CENTERFIRE PISTOL AND REVOLVER

Cartridge	Symbol	Wt. Gr.	Bullet Type	Velocity-FPS Muzzle	50 Yds.	100 Yds.	Muzzle	50 Yds.	100 Yds.	Mid Range Trajectory Inches 50 Yds.	100 Yds.	Barrel Length Inches
25 Automatic (6.35mm)	X25AXP	45	XP	815	729	655	66	53	42	1.8	7.7	2
25 Automatic (6.35mm)	X25AP	50	FMC	760	707	659	64	56	48	2.0	8.7	2
256 Winchester Magnum Super-X	X2561P	60	HP	2350	2030	1760	735	550	415	0.3	1.1	8½
30 Luger (7.65mm)	X30LP	93	FMC	1220	1110	1040	305	255	225	0.9	3.5	4½
32 Automatic	X32AP	71	FMC	905	855	810	129	115	97	1.4	5.8	4
32 Automatic	X32ASHP	60	STHP	970	895	835	125	107	93	1.3	5.4	4
32 Smith & Wesson (inside lubricated)	X32SWP	85	Lead	680	645	610	90	81	73	2.5	10.5	3
32 Smith & Wesson Long (inside lubricated)	X32SWLP	98	Lead	705	670	635	115	98	88	2.3	10.5	4
32 Short Colt (greased)	X32SCP	80	Lead	745	665	590	100	79	62	2.2	9.9	4
32 Long Colt (inside lubricated)	X32LCP	82	Lead	755	715	675	105	93	83	2.0	8.7	4
357 Magnum Jacketed Hollow Point Super-X	X3573P	110	JHP	1295	1094	975	410	292	232	0.8	3.5	4V
357 Magnum Jacketed Hollow Point Super-X	X3576P	125	JHP	1450	1240	1090	583	427	330	0.6	2.8	4V
357 Magnum Silvertip Hollow Point Super-X	X357SHP	145	STHP	1290	1155	1060	535	428	361	0.8	3.5	4V
357 Magnum Super-X (inside lubricated)	X3571P	158	Lead	1235	1104	1015	535	428	361	0.8	3.5	4V
357 Magnum Jacketed Hollow Point Super-X	X3574P	158	JHP	1235	1104	1015	535	428	361	0.8	3.5	4V
357 Magnum Jacketed Soft Point Super-X	X3575P	158	JSP	1235	1104	1015	535	428	361	0.8	3.5	4V
9mm Luger (Parabellum)	X9MMJSP	95	JSP	1355	1140	1008	387	274	214	0.7	3.3	4
9mm Luger (Parabellum)	X9LP	115	FMC	1155	1047	971	341	280	241	0.9	3.9	4
9mm Luger (Parabellum)	X9MMSHP	115	STHP	1225	1095	1007	383	306	259	0.8	3.6	4
38 Smith & Wesson (inside lubricated)	X38SWP	145	Lead	685	650	620	150	135	125	2.4	10.0	4
38 Special (inside lubricated)	X38S1P	158	Lead	755	723	693	200	183	168	2.0	8.3	4V
38 Special Semi-Wad Cutter (inside lubricated)	X38WCPSV	158	Lead-SWC	755	721	689	200	182	167	2.0	8.4	4V
38 Special Metal Point (inside lubricated, lead bearing)	X38S2P	158	Met.Pt.	755	723	693	200	183	168	2.0	8.3	4V
38 Special Super-Police (inside lubricated)	X38S3P	200	Lead	635	614	594	179	168	157	2.8	11.5	4V
38 Special Super-X Jacketed Hollow Point +P	X38S6PH	110	JHP	995	926	871	242	210	185	1.2	5.1	4V
38 Special Super-X Jacketed Hollow Point +P	X38S7PH	125	JHP	945	898	858	248	224	204	1.3	5.4	4V
38 Special Super-X Silvertip Hollow Point +P	X38SSHP	95	STHP	1100	1002	932	255	212	183	1.0	4.3	4V
38 Special Super-X Silvertip Hollow Point +P NEW	X38S8HP	125	STHP	945	898	858	248	224	204	1.3	5.4	4V
38 Special Super-X (inside lubricated) +P	X38S4P	150	Lead	860	825	794	246	227	210	1.5	6.3	4V
38 Special Super-X (inside lubricated) +P	X38SPD	158	Lead-HP	890	855	823	278	257	238	1.4	6.0	4V
38 Special-X Semi-Wad Cutter (inside lubricated) +P	X38WCP	158	Lead-SWC	890	855	823	278	257	238	1.4	6.0	4V
38 Special Super-Match and Match Mid-Range Clean Cutting (inside lubricated)	X38SMRP	148	Lead-WC	710	634	566	166	132	105	2.4	10.8	4V
38 Special Super Match (inside lubricated)	X38SMP	158	Lead	755	723	693	200	183	168	2.0	8.3	4V
38 Short Colt (greased)	X38SCP	130	Lead	730	685	645	150	130	115	2.2	9.4	6
38 Long Colt (inside lubricated)	X38LCP	150	Lead	730	700	670	175	165	150	2.1	8.8	6
38 Super Automatic Silvertip Hollow Point +P	X38ASHP	125	STHP	1240	1130	1050	427	354	306	0.8	3.4	5
38 Super Automatic +P	X38A1P	130	FMC	1215	1099	1017	426	348	298	0.8	3.6	5
38 Automatic (For all 38 Colt Automatic Pistols)	X38A2P	130	FMC	1040	980	925	310	275	245	1.0	4.7	4½
380 Automatic	X380AP	95	FMC	955	865	785	190	160	130	1.4	5.9	3¾
380 Automatic	X380ASHP	85	STHP	1000	921	860	189	160	140	1.2	5.1	3¾
41 Remington Magnum Super-X (inside Lubricated)	X41MP	210	Lead	965	898	842	434	376	331	1.3	5.4	4V
41 Remington Magnum Super-X Jacketed Soft Point	X41MJSP	210	JSP	1300	1162	1062	788	630	526	0.7	3.2	4V
41 Remington Magnum Super-X Jacketed Hollow Point	X41MHP	210	JHP	1300	1162	1062	788	630	526	0.7	3.2	4V
44 Smith & Wesson Special	X44STHPS	200	STHP	900	860	822	360	328	300	1.4	5.9	6½
44 Smith & Wesson Special (inside lubricated)	X44SP	246	Lead	755	725	695	310	285	265	2.0	8.3	6½
44 Remington Magnum Super-X (Gas Check) (inside Lubricated)	X44MP	240	Lead	1350	1186	1069	971	749	608	0.7	3.1	4V
45 Colt Silvertip Hollow Point	X45CSHP	225	STHP	920	877	839	423	384	352	1.4	5.6	5½
45 Colt (inside lubricated)	X45CP	255	Lead	860	820	780	420	380	345	1.5	6.1	5½
45 Automatic	X45ASHP	185	STHP	1000	938	888	411	362	324	1.2	4.9	5
45 Automatic	X45A1P	230	FMC	810	776	745	335	308	284	1.7	7.2	5
45 Automatic Super-Match Clean Cutting	X45AWCP	185	FMC-WC	770	707	650	244	205	174	2.0	8.7	5
45 Winchester Magnum Super-X	X45WM	230	FMC	1400	1232	1107	1001	775	636	0.6	2.8	5

TABLE XVIII, Continued

RIMFIRE RIFLE

Cartridge	Symbol	Wt.Grs.	Bullet Type	Velocity (ft./s.) Muzzle	Velocity (ft./s.) 100 yds	Energy (ft. lbs.) Muzzle	Energy (ft. lbs.) 100 yds.	Nominal Mid-Range Traj. (in.) 100 yds.
22 Short Super-X	X22S	29	L**	1095	903	77	52	4.5
22 Short H.P. Super-X	X22SH	27	L**	1120	904	75	49	4.4
22 Long Rifle Super-X	X22LR	40	L**	1255	1017	140	92	3.6
22 Long Rifle H.P. Super-X	X22LRH	37	L**	1280	1015	135	85	3.5
22 Long Rifle Shot Supper-X (#12 Shot)	X22LRS	—	—	—	—	—	—	—
22 Winchester MAGNUM R.F. Super-X	X22WMR	40	JHP	1910	1326	324	156	1.7
22 Winchester MAGNUM R.F. Super-X	X22MR1	40	FMC	1910	1326	324	156	1.7
22 Short T22	XT22S	29	Lead**	1045	872	70	49	4.8
22 Long Rifle T22	XT22LR	40	Lead**	1150	976	117	85	4.0
22 Long Rifle Silhouette	XS22LR	42	Lead**	1220	1003	139	94	3.6
22 Short C.B.	WW22CBS2	29	Lead**	715	—	33	—	—

RIMFIRE PISTOL AND REVOLVER

Cartridge	Symbol	Wt.Grs.	Bullet Type	Barrel Length	Muzzle Velocity (ft/s)	Muzzle Energy (ft. lbs.)
22 Short Blank	22 BL	—	—	—	—	—
22 Short Super-X	X22S	29	L**	6″	1010	66
22 Short T22	XT22S	29	Lead**	6″	865	48
22 Long Super-X	X22L	29	L**	6″	1095	77
22 Long Rifle Super-X	X22LR	40	L**	6″	1060	100
22 Long Rifle T22	XT22LR	40	Lead**	6″	950	80
22 Long Rifle Silhouette	XS22LR	42	Lead**	6″/10″	1025/1105	98/114
22 Long Rifle Super-Match Mark IV	SM22LR4	40	Lead**	6¾″	1060	100
22 Winchester MAGNUM Rimfire Super-X	X22WMR	40	JHP	6½″	1480	195
22 Winchester MAGNUM Rimfire Super-X	X22MR1	40	FMC	6½″	1480	195

FMC — Full Metal Case
JHP — Jacketed Hollow Point
JSP — Jacketed Soft Point
Met. Pt. — Metal Point
XP — Expanding Point
WC — Wad Cutter
SWC — Semi Wad Cutter
STHP — Silvertip Hollow Point HP — Hollow Point
L — Lubaloy
***Wax Coated*

+P Ammunition with (+P) on the case head stamp is loaded to higher pressure. Use only in firearms designated for this cartridge and so recommended by the gun manufacturer.
V-Data is based on velocity obtained from 4" vented test barrels for revolver cartridges (38 Special, 357 Magnum, 41 Rem. Mag. and 44 Rem. Mag.)
**For use only in 38 Super Automatic Pistols.*

Specifications are nominal. Test barrels are used to determine ballistics figures. Individual firearms may differ from test barrel statistics.
Specifications subject to change without notice.

TABLE XVIII

Ballistics of Winchester Centerfire Rifle Ammunition

CENTERFIRE RIFLE

Cartridge	Symbol	Game Selector Guide	Wt. Grs.	Bullet Type	Barrel Length Inches	Velocity In Fee Per Second Muzzle	100	200	300	400	500	Muzzle	100
218 Bee Super-X	X218B	S	46	HP	24	2760	2102	1550	1155	961	850	778	451
22 Hornet Super-X	X22H1	S	45	SP	24	2690	2042	1502	1128	948	840	723	417
22 Hornet Super-X	X22H2	S	46	HP	24	2690	2042	1502	1128	948	841	739	426
22–250 Remington Super-X	X222501	S	55	PSP	24	3680	3137	2656	2222	1832	1493	1654	1201
222 Remington Super-X	X222R	S	50	PSP	24	3140	2602	2123	1700	1350	1107	1094	752
222 Remington Super-X	X222R1	S	55	FMC	24	3020	2675	2355	2057	1783	1537	1114	874
223 Remington Super-X NEW	X223RH	S	53	HP	24	3330	2882	2477	2106	1770	1475	1305	978
223 Remington Super-X	X223R	S	55	PSP	24	3240	2747	2304	1905	1554	1270	1282	921
223 Remington Super-X	X223R1	S	55	FMC	24	3240	2877	2543	2232	1943	1679	1282	1011
225 Winchester Super-X	X2251	S	55	PSP	24	3570	3066	2616	2208	1838	1514	1556	1148
243 Winchester Super-X	X2431	S	80	PSP	24	3350	2955	2593	2259	1951	1670	1993	1551
243 Winchester Super-X	X2432	D,O/P	100	PP(SP)	24	2960	2697	2449	2215	1993	1786	1945	1615
6mm Remington Super-X	X6MMR1	S	80	PSP	24	3470	3064	2694	2352	2036	1747	2139	1667
6mm Remington Super-X	X6MMR2	D,O/P	100	PP(SP)	24	3100	2829	2573	2332	2104	1889	2133	1777
25–06 Remington Super-X	X25061	S	90	PEP	24	3440	3043	2680	2344	2034	1749	2364	1850
25–06 Remington Super-X	X25062	D,O/P	120	PEP	24	2990	2730	2484	2252	2032	1825	2382	1985
25–20 Winchester	X25202	S	86	SP	24	1460	1194	1030	931	858	798	407	272
25–35 Winchester Super-X	X2535	D	117	SP	24	2230	1866	1545	1282	1097	984	1292	904
250 Savage Super-X	X2501	S	87	PSP	24	3030	2673	2342	2036	1755	1504	1773	1380
250 Savage Super-X	X2503	D,O/P	100	ST	24	2820	2467	2140	1839	1569	1339	1765	1351
256 Winchester Mag. Super-X	X2561P	S	60	HP	24	2760	2097	1542	1149	1957	846	1015	586
257 Roberts +P Super-X	X257P2	D,O/P	100	ST	24	3000	2633	2295	1982	1697	1447	1998	1539
257 Roberts +P Super-X	X257P3	D,O/P	117	PP(SP)	24	2780	2411	2071	1761	1488	1263	2009	1511
264 Winchester Mag. Super-X	X2641	S	100	PSP	24	3320	2926	2565	2231	1923	1644	2447	1901
264 Winchester Mag. Super-X	X2642	D,O/P	140	PP(SP)	24	3030	2782	2548	2326	2114	1914	2854	2406
270 Winchester Super-X	X2701	S	100	PSP	24	3430	3021	2649	2305	1988	1699	2612	2027
270 Winchester Super-X	X2705	D,O/P	130	PP(SP)	24	3060	2802	2559	2329	2110	1904	2702	2267
270 Winchester Super-X	X2703	D,O/P	130	ST	24	3060	2776	2510	2259	2022	1801	2702	2225
270 Winchester Super-X	X2704	D,L	150	PP(SP)	24	2850	2585	2336	2100	1879	1673	2705	2226
284 Winchester Super-X	X2841	D,O/P	125	PP(SP)	24	3140	2829	2538	2265	2010	1772	2736	2221
284 Winchester Super-X	X2842	D,O/P,L	150	PP(SP)	24	2860	2595	2344	2108	1886	1680	2724	2243
7mm Mauser (7×57) Super-X	X7MM	D	175	SP	24	2440	2137	1857	1603	1382	1204	2313	1774
7mm Remington Mag. Super-X	X7MMR3	D,O/P	125	PP(SP)	24	3310	2976	2666	2376	2105	1852	3040	2458
7mm Remington Mag. Super-X	X7MMR1	D,O/P	150	PP(SP)	24	3110	2830	2568	2320	2085	1866	3221	2667
7mm Remington Mag. Super-X	X7MMR2	D,O/P,L	175	PP(SP)	24	2860	2645	2442	2244	2057	1879	3178	2718
30 Carbine	X30M1	S	110	HSP	20	1990	1567	1236	1035	923	842	967	600
30 Carbine	X30M2	S	110	FMC	20	1990	1596	1278	1070	952	870	967	622
30–30 Winchester Super-X	X30301	D	150	HP	24	2390	2018	1684	1398	1177	1036	1902	1356
30–30 Winchester Super-X	X30306	D	150	PP(SP)	24	2390	2018	1684	1398	1177	1036	1902	1356
30–30 Winchester Super-X	X30302	D	150	ST	24	2390	2018	1684	1398	1177	1036	1902	1356
30–30 Winchester Super-X	X30303	D	170	PP(SP)	24	2200	1895	1619	1381	1191	1061	1827	1355
30–30 Winchester Super-X	X30304	D	170	ST	24	2200	1895	1619	1381	1191	1061	1827	1355
30–06 Springfield Super-X	X30060	S	110	PSP	24	3330	2799	2325	1901	1532	1239	2708	1913
30–06 Springfield Super-X	X30062	S	125	PSP	24	3140	2780	2447	2138	1853	1595	2736	2145
30–06 Springfield Super-X	X30061	D,O/P	150	PP(SP)	24	2920	2580	2265	1972	1704	1466	2839	2217
30–06 Springfield Super-X	X30063	D,O/P	150	ST	24	2910	2617	2342	2083	1843	1622	2820	2281
30–06 Springfield Super-X NEW	X30065	D,O/P	165	PSP	24	2800	2573	2357	2151	1956	1772	2873	2426
30–06 Springfield Super-X	X30064	D,O/P,L	180	PP(SP)	24	2700	2348	2023	1727	1466	1251	2913	2203
30–06 Springfield Super-X	X30066	D,O/P,L	180	ST	24	2700	2469	2250	2042	1846	1663	2913	2436
30–06 Springfield Super-X	X30068	L	220	PP(SP)	24	2410	2130	1870	1632	1422	1246	2837	2216
30–06 Springfield Super-X	X30069	L	220	ST	24	2410	2192	1985	1791	1611	1448	2837	2347
30–40 Krag Super-X	X30401	D	180	PP(SP)	24	2430	2099	1795	1525	1298	1128	2360	1761
30–40 Krag Super-X	X30403	D	180	ST	24	2430	2213	2007	1813	1632	1468	2360	1957
300 Winchester Mag. Super-X	X30WM1	D,O/P	150	PP(SP)	24	3290	2951	2636	2342	2068	1813	3605	2900
300 Winchester Mag. Super-X	X30WM2	O/P,L	180	PP(SP)	24	2960	2745	2540	2344	2157	1979	3501	3011
300 Winchester Mag. Super-X	X30WM3	L,XL	220	ST	24	2680	2448	2228	2020	1823	1640	3508	2927
300 H. & H. Magnum Super-X	X300H2	O/P,L	180	ST	24	2880	2640	2412	2196	1991	1798	3315	2785
300 Savage Super-X	X3001	D,O/P	150	PP(SP)	24	2630	2311	2015	1743	1500	1295	2303	1779
300 Savage Super-X	X3003	D,O/P	150	ST	24	2630	2354	2095	1853	1631	1434	2303	1845
300 Savage Super-X	X3004	D	180	PP(SP)	24	2350	2025	1728	1467	1252	1098	2207	1639
300 Savage Super-X	X3005	D	180	ST	24	2350	2137	1935	1745	1570	1413	2207	1825
303 Savage Super-X	X3032	D	190	ST	24	1890	1612	1372	1183	1055	970	1507	1096
303 British Super-X	X303B1	D	180	PP(SP)	24	2460	2233	2018	1816	1629	1459	2418	1993
307 Winchester	X3075	D	150	PP(SP)	24	2760	2321	1924	1575	1289	1091	2538	1795
307 Winchester	X3076	D	180	PP(SP)	24	2510	2179	1874	1599	1362	1177	2519	1898
308 Winchester Super-X	X3081	S	110	PSP	24	3180	2666	2206	1795	1444	1178	2470	1736
308 Winchester Super-X	X3087	S	125	PSP	24	3050	2697	2370	2067	1788	1537	2582	2019
308 Winchester Super-X	X3085	D,O/P	150	PP(SP)	24	2820	2488	2179	1893	1633	1405	2648	2061
308 Winchester Super-X	X3082	D,O/P	150	ST	24	2820	2533	2263	2009	1774	1560	2648	2137
308 Winchester Super-X	X3086	D,O/P,L	180	PP(SP)	24	2620	2274	1955	1666	1414	1212	2743	2066

TABLE XVIII, Continued

Ballistics of Winchester Centerfire Rifle Ammunition

CENTERFIRE RIFLE

Cartridge	Symbol	Game Selector Guide	Wt. Grs.	Bullet Type	Barrel Length Inches	Velocity In Fee Per Second Muzzle	100	200	300	400	500	Muzzle	100
308 Winchester Super-X	X3083	D,O/P,L	180	ST	24	2620	2393	2178	1974	1782	1604	2743	2288
308 Winchester Super-X	X3084	L	200	ST	24	2450	2208	1980	1767	1572	1397	2665	2165
32 Win. Special Super-X	X32WS2	D	170	PP(SP)	24	2250	1870	1537	1267	1082	971	1911	1320
32 Win. Special Super-X	X32WS3	D	170	ST	24	2250	1870	1537	1267	1082	971	1911	1320
32–20 Winchester	X32202	S	100	SP	24	1210	1021	913	834	769	712	325	231
32–20 Winchester	X32201	S	100	Lead	24	1210	1021	913	834	769	712	325	231
8mm Mauser (8×57) Super-X	X8MM	D	170	PP(SP)	24	2360	1969	1622	1333	1123	997	2102	1463
338 Winchester Mag. Super-X	X3381	D,O/P	200	PP(SP)	24	2960	2658	2375	2110	1862	1635	3890	3137
338 Winchester Mag. Super-X	X3383	L,XL	225	SP	24	2780	2570	2374	2184	2003	1832	3862	3306
348 Winchester Super-X	X3482	D,L	200	ST	24	2520	2215	1931	1672	1443	1253	2820	2178
35 Remington Super-X	X35R1	D	200	PP(SP)	24	2020	1646	1335	1114	985	901	1812	1203
35 Remington Super-X	X35R3	D	200	ST	24	2020	1646	1335	1114	985	901	1812	1203
351 Winchester S.L.	X351SL2	D	180	SP	20	1850	1556	1310	1128	1012	933	1368	968
356 Winchester	X3561	D,L	200	PP(SP)	24	2460	2114	1797	1517	1284	1113	2688	1985
356 Winchester	X3563	L	250	PP(SP)	24	2160	1911	1682	1476	1299	1158	2591	2028
358 Winchester Super-X	X3581	D,L	200	ST	24	2490	2171	1876	1610	1379	1194	2753	2093
375 Winchester	X375W	D,L	200	PP(SP)	24	2200	1841	1526	1268	1089	980	2150	1506
375 Winchester	X375W1	D,L	250	PP(SP)	24	1900	1647	1424	1239	1103	1011	2005	1506
375 H. & H. Magnum Super-X	X375H1	L,XL	270	PP(SP)	24	2690	2420	2166	1928	1707	1507	4337	3510
375 H. & H. Magnum Super-X	X375H2	L,XL	300	ST	24	2530	2268	2022	1793	1583	1397	4263	3426
375 H. & H. Magnum Super-X	X375H3	L,XL	300	FMC	24	2530	2171	1843	1551	1307	1126	4263	3139
38–40 Winchester	X3840	D	180	SP	24	1160	999	901	827	764	710	538	399
38–55 Winchester	X3855	D	255	SP	24	1320	1190	1091	1018	963	917	987	802
44 Remington Magnum Super-X	X44MHSP	D	240	HSP	20	1760	1362	1094	953	861	789	1650	988
44–40 Winchester	X4440	D	200	SP	24	1190	1006	900	822	756	699	629	449
45–70 Government	X4570H	D,L	300	JHP	24	1880	1650	1425	1235	1105	1010	2355	1815
458 Winchester Mag. Super-X	X4580	XL	500	FMC	24	2040	1823	1623	1442	1287	1161	4620	3689
458 Winchester Mag. Super-X	X4581	L,XL	510	SP	24	2040	1770	1527	1319	1157	1046	4712	3547

HSP — Hollow Soft Point PEP — Positive Expanding Point PSP — Pointed Soft Point PP(SP) — Power-Point® Soft Point FMC — Full Metal Case SP — Soft Point HP — Hollow Point ST — Silvertip® JHP — Jacketed Hollow Point GAME SELECTOR CODE

S = Small Game D = Deer L = Large Game (i.e. Moose, Elk) O/P = Open or Plains shooting (i.e, Antelope, Deer) XL = Extra Large Game (i.e. Kodiak Bear)

Energy In Foot Pounds				Short Range						Long Range						
200	300	400	500	50	100	150	200	250	300	100	150	200	250	300	400	500
				Yards						Yards						
245	136	94	74	0.3	0	−2.3	−7.2	−15.8	−29.4	1.5	0	−4.2	−12.0	−24.8	−71.4	−155.6
225	127	90	70	0.3	0	−2.4	−7.7	−16.9	−31.3	1.6	0	−4.5	−12.8	−26.4	−75.6	−163.4
230	130	92	72	0.3	0	−2.4	−7.7	−16.9	−31.3	1.6	0	−4.5	−12.8	−26.4	−75.5	−163.3
861	603	410	272	0.2	0.5	0	−1.6	−4.4	−8.7	2.3	2.6	1.9	0	−3.4	−15.9	−38.9
500	321	202	136	0.5	0.9	0	−2.5	−6.9	−13.7	2.2	1.9	0	−3.8	−10.0	−32.3	−73.8
677	517	388	288	0.5	0.9	0	−2.2	−6.1	−11.7	2.0	1.7	0	−3.3	−8.3	−24.9	−52.5
722	522	369	256	0.3	0.7	0	−1.9	−5.3	−10.3	1.7	1.4	0	−2.9	−7.4	−22.7	−49.1
648	443	295	197	0.4	0.8	0	−2.2	−6.0	−11.8	1.9	1.6	0	−3.3	−8.5	−26.7	−59.6
790	608	461	344	0.4	0.7	0	−1.9	−5.1	−9.9	1.7	1.4	0	−2.8	−7.1	−21.2	−44.6
836	595	412	280	0.2	0.6	0	−1.7	−4.6	−9.0	2.4	2.8	2.0	0	−3.5	−16.3	−39.5
1194	906	676	495	0.3	0.7	0	−1.8	−4.9	−9.4	2.6	2.9	2.1	0	−3.6	−16.2	−37.9
1332	1089	882	708	0.5	0.9	0	−2.2	−5.8	−11.0	1.9	1.6	0	−3.1	−7.8	−22.6	−46.3
1289	982	736	542	0.3	0.6	0	−1.6	−4.5	−8.7	2.4	2.7	1.9	0	−3.3	−14.9	−35.0
1470	1207	983	792	0.4	0.8	0	−1.9	−5.2	−9.9	1.7	1.5	0	−2.8	−7.0	−20.4	−41.7
1435	1098	827	611	0.3	0.6	0	−1.7	−4.5	−8.8	2.4	2.7	2.0	0	−3.4	−15.0	−35.2
1644	1351	1100	887	0.5	0.8	0	−2.1	−5.6	−10.7	1.9	1.6	0	−3.0	−7.5	−22.0	−44.8
203	165	141	122	0	−4.1	−14.4	−31.8	−57.3	−92.0	0	−8.2	−23.5	−47.0	−79.6	−175.9	−319.4
620	427	313	252	0.6	0	−3.1	−9.2	−19.0	−33.1	2.1	0	−5.1	−13.8	−27.0	−70.1	−142.0
1059	801	595	437	0.5	0.9	0	−2.3	−6.1	−11.8	2.0	1.7	0	−3.3	−8.4	−25.2	−53.4
1017	751	547	398	0.2	0	−1.6	−4.9	−10.0	−17.4	2.4	2.0	0	−3.9	−10.1	−30.5	−65.2
317	176	122	95	0.3	0	−2.3	−7.3	−15.9	−29.6	1.5	0	−4.2	−12.1	−25.0	−72.1	−157.2
1169	872	639	465	0.6	0.9	0	−2.4	−4.9	−12.3	2.9	3.0	1.6	0	−6.4	−23.2	−51.2
1115	806	576	373	0.8	1.1	0	−2.9	−7.8	−15.1	2.6	2.2	0	−4.2	−10.8	−33.0	−70.0
1461	1105	821	600	0.3	0.7	0	−1.8	−5.0	−9.7	2.7	3.0	2.2	0	−3.7	−16.6	−38.9
2018	1682	1389	1139	0.5	0.8	0	−2.0	−5.4	−10.2	1.8	1.5	0	−2.9	−7.2	−20.8	−42.2
1557	1179	877	641	0.3	0.6	0	−1.7	−4.6	−9.0	2.5	2.8	2.0	0	−3.4	−15.5	−36.4
1890	1565	1285	1046	0.4	0.8	0	−2.0	−5.3	−10.1	1.8	1.5	0	−2.8	−7.1	−20.6	−42.0
1818	1472	1180	936	0.5	0.8	0	−2.0	−5.5	−10.4	1.8	1.5	0	−2.9	−7.4	−21.6	−44.3
1817	1468	1175	932	0.6	1.0	0	−2.4	−6.4	−12.2	2.2	1.8	0	−3.4	−8.6	−25.0	−51.4
1788	1424	1121	871	0.4	0.8	0	−2.0	−6.4	−10.1	1.7	1.5	0	−2.8	−7.2	−21.1	−43.7
1830	1480	1185	940	0.6	1.0	0	−2.4	−6.3	−12.1	2.1	1.8	0	−3.4	−8.5	−24.8	−51.0
1340	998	742	563	0.4	0	−2.3	−6.8	−13.8	−23.7	1.5	0	−3.7	−10.0	−19.1	−48.1	−95.4

Table XVIII, Continued

1972	1567	1230	952	0.3	0.6	0	−1.7	−4.7	−9.1	2.5	2.8	2.0	0	−3.4	−15.0	−34.5
2196	1792	1448	1160	0.4	0.8	0	−1.9	−5.2	−9.9	1.7	1.5	0	−2.8	−7.0	−20.5	−42.1
2313	1956	1644	1372	0.6	0.9	0	−2.3	−6.0	−11.3	2.0	1.7	0	−3.2	−7.9	−22.7	−45.8
373	262	208	173	0.9	0	−4.5	−13.5	−28.3	−49.9	0	−4.5	−13.5	−28.3	−49.9	−118.6	−228.2
399	280	221	185	0.9	0	−4.3	−13.0	−26.9	−47.4	2.9	0	−7.2	−19.7	−38.7	−100.4	−200.5
944	651	461	357	0.5	0	−2.6	−7.7	−16.0	−27.9	1.7	0	−4.3	−11.6	−22.7	−59.1	−120.5
944	651	461	357	0.5	0	−2.6	−7.7	−16.0	−27.9	1.7	0	−4.3	−11.6	−22.7	−59.1	−120.5
944	651	461	357	0.5	0	−2.6	−7.7	−16.0	−27.9	1.7	0	−4.3	−11.6	−22.7	−59.1	−120.5
989	720	535	425	0.6	0	−3.0	−8.9	−18.0	−31.1	2.0	0	−4.8	−13.0	−25.1	−63.6	−126.7
989	720	535	425	0.6	0	−3.0	−8.9	−18.0	−31.1	2.0	0	−4.8	−13.0	−25.1	−63.6	−126.7
1321	882	573	375	0.4	0.8	0	−2.1	−5.8	−11.5	1.8	1.6	0	−3.2	−8.3	−26.4	−59.6
1662	1269	953	706	0.4	0.8	0	−2.1	−5.6	−10.7	1.8	1.5	0	−3.0	−7.7	−23.0	−48.5
1708	1295	967	716	0.6	1.0	0	−2.4	−6.6	−12.7	2.2	1.8	0	−3.5	−9.0	−27.0	−57.1
1827	1445	1131	876	0.6	0.9	0	−2.3	−6.3	−12.0	2.1	1.8	0	−3.3	−8.5	−25.0	−51.8
2036	1696	1402	1151	0.7	1.0	0	−2.5	−6.5	−12.2	2.2	1.9	0	−3.6	−8.4	−24.4	−49.6
1635	1192	859	625	0.2	0	−1.8	−5.5	−11.2	−19.5	2.7	2.3	0	−4.4	−11.3	−34.4	−73.7
2023	1666	1362	1105	0.2	0	−1.6	−4.8	−9.7	−16.5	2.4	2.0	0	−3.7	−9.3	−27.0	−54.9
1708	1301	988	758	0.4	0	−2.3	−6.8	−13.8	−23.6	1.5	0	−3.7	−9.9	−19.0	−47.4	−93.1
1924	1567	1268	1024	0.4	0	−2.2	−6.4	−12.7	−21.6	1.5	0	−3.5	−9.1	−17.2	−41.8	−79.9
1288	929	673	508	0.4	0	−2.4	−7.1	−14.5	−25.0	1.6	0	−3.9	−10.5	−20.3	−51.7	−103.9
1610	1314	1064	861	0.4	0	−2.1	−6.2	−12.5	−21.1	1.4	0	−3.4	−8.9	−16.8	−40.9	−78.1
2314	1827	1424	1095	0.3	0.7	0	−1.8	−4.8	−9.3	2.6	2.9	2.1	0	−3.5	−15.4	−35.5
2578	2196	1859	1565	0.5	0.8	0	−2.1	−5.5	−10.4	1.9	1.6	0	−2.9	−7.3	−20.9	−41.9
2424	1993	1623	1314	0.2	0	−1.7	−4.9	−9.9	−16.9	2.5	2.0	0	−3.8	−9.5	−27.5	−56.1
2325	1927	1584	1292	0.6	0.9	0	−2.3	−6.0	−11.5	2.1	1.7	0	−3.2	−8.0	−23.3	−47.4
1352	1012	749	558	0.3	0	−1.9	−5.7	−11.6	−19.9	2.8	2.3	0	−4.5	−11.5	−34.4	−73.0
1462	1143	886	685	0.3	0	−1.8	−5.4	−11.0	−18.8	2.7	2.2	0	−4.2	−10.7	−31.5	−65.5
1193	860	626	482	0.5	0	−2.6	−7.7	−15.6	−27.1	1.7	0	−4.2	−11.3	−21.9	−55.8	−112.0
1496	1217	985	798	0.4	0	−2.3	−6.7	−13.5	−22.8	1.5	0	−3.6	−9.6	−18.2	−44.1	−84.2
794	591	469	397	1.0	0	−4.3	−12.6	−25.5	−43.7	29	0	−6.8	−18.3	−35.1	−88.2	−172.5
1627	1318	1060	851	0.3	0	−2.1	−6.1	−12.2	−20.8	1.4	0	−3.3	−8.8	−16.6	−40.4	−77.4
1233	826	554	397	0.2	0	−1.9	−5.6	−11.8	−20.8	1.2	0	−3.2	−8.7	−17.1	−44.9	−92.2
1404	1022	742	554	0.3	0	−2.2	−6.5	−13.3	−22.9	1.5	0	−3.6	−9.6	−18.6	−47.1	−93.7
1188	787	509	339	0.5	0.9	0	−2.3	−6.5	−12.8	2.0	1.8	0	−3.5	−9.3	−29.5	−66.7
1559	1186	1887	656	0.5	0.8	0	−2.2	−6.0	−11.5	2.0	1.7	0	−3.2	8.2	−24.6	−51.9
1581	1193	888	657	0.2	0	−1.6	−4.8	−9.8	−16.9	2.4	2.0	0	−3.8	−9.8	−29.3	−62.0
1705	1344	1048	810	0.2	0	−1.5	−4.5	−9.3	−15.9	2.3	1.9	0	−3.6	−9.1	−26.9	−55.7
1527	1109	799	587	0.3	0	−2.0	−5.9	−12.1	−20.9	2.9	2.4	0	−4.7	−12.1	−36.9	−79.1
1896	1557	1269	1028	0.2	0	−1.8	−5.2	−10.4	−17.7	2.6	2.1	0	−4.0	−9.9	−28.9	−58.8
1741	1386	1097	867	0.4	0	−2.1	−6.3	−12.6	−21.4	1.4	0	−3.1	−9.0	−17.2	−42.1	−81.1
892	606	442	356	0.6	0	−3.1	−9.2	−19.0	−33.2	2.0	0	−5.1	−13.8	−27.1	−70.9	−144.3
892	606	442	356	0.6	0	−3.1	−9.2	−19.0	−33.2	2.0	0	−5.1	−13.8	−27.1	−70.9	−144.3
185	154	131	113	0	−6.3	−20.9	−44.9	−79.3	−125.1	0	−11.5	−32.3	−63.6	−106.3	−230.3	−413.3
185	154	131	113	0	−6.3	−20.9	−44.9	−79.3	−125.1	0	−11.5	−32.3	−63.6	−106.3	−230.3	−413.3
993	671	476	375	0.5	0	−2.7	−8.2	−17.1	−29.8	1.8	0	−4.5	−12.4	−24.3	−63.8	−130.7
2505	1977	1539	1187	0.5	0.9	0	−2.3	−6.1	−11.6	2.0	1.7	0	−3.2	−8.2	−24.3	−50.4
2816	2384	2005	1677	1.2	1.3	0	−2.7	−7.1	−12.9	2.7	2.1	0	−3.6	−9.4	−25.0	−49.9
1656	1241	925	697	0.3	0	−2.1	−6.2	−12.7	−21.9	1.4	0	−3.4	−9.2	−17.7	−44.4	−87.9
791	551	431	360	0.9	0	−4.1	−12.1	−25.1	−43.9	2.7	0	−6.7	−18.3	−35.8	−92.8	−185.5
791	551	431	360	0.9	0	−4.1	−12.1	−25.1	−43.9	2.7	0	−6.7	−18.3	−35.8	−92.8	−185.5
686	508	409	348	0	−2.1	−7.8	−17.8	−32.9	−53.9	0	−4.7	−13.6	−27.6	−47.5	−108.8	−203.9
1434	1022	732	550	0.4	0	−2.3	−7.0	−14.3	−24.7	1.6	0	−3.8	−10.4	−20.1	−51.2	−102.3
1571	1210	937	745	0.6	0	−3.0	−8.7	−17.4	−30.0	2.0	0	−4.7	−12.4	−23.7	−58.4	−112.9
1563	1151	844	633	0.4	0	−2.2	−6.5	−13.3	−23.0	1.5	0	−3.6	−9.7	−18.6	−47.2	−94.1
1034	714	527	427	0.6	0	−3.2	−9.5	−19.5	−33.8	2.1	0	−5.2	−14.1	−27.4	−70.1	−138.1
1126	852	676	568	0.9	0	−4.1	−12.0	−24.0	−40.9	2.7	0	−6.5	−17.2	−32.7	−80.6	−154.1
2812	2228	1747	1361	0.2	0	−1.7	−5.1	−10.3	−17.6	2.5	2.1	0	−3.9	−10.0	−29.4	−60.7
2723	2141	1669	1300	0.3	0	−2.0	−5.9	−11.9	−20.3	2.9	2.4	0	−4.5	−11.5	−33.8	−70.1
2262	1602	1138	844	0.3	0	−2.2	−6.5	−13.5	−23.4	1.5	0	−3.6	−9.8	−19.1	−49.1	−99.5
324	273	233	201	0	−6.7	−22.2	−47.3	−83.2	−130.8	0	−12.1	−39.9	−66.4	−110.6	−238.3	−425.6
674	587	525	476	0	−4.7	−15.4	−32.7	−57.2	−89.3	0	−8.4	−23.4	−45.6	−75.2	−158.8	−277.4
638	484	395	232	0	−2.7	−10.2	−23.6	−44.2	−73.3	0	−6.1	−18.1	−37.4	−65.1	−150.3	−282.5
360	300	254	217	0	−6.5	−21.6	−46.3	−81.8	−129.1	0	−11.8	−33.3	−65.5	−109.5	−237.4	−426.2
1355	1015	810	680	0	−2.4	−8.2	−17.6	−31.4	−51.5	0	−4.6	−12.8	−25.4	−44.3	−95.5	—
2924	2038	1839	1496	0.7	0	−3.3	−9.6	−19.2	−32.5	2.2	0	−5.2	−13.6	−25.8	−63.2	−121.7
2640	1970	1516	1239	0.8	0	−3.5	−10.3	−20.8	−35.6	2.4	0	−5.6	−14.9	−28.5	−71.5	−140.4

TRAJECTORY inches above (+) or below (−) line of sight 0 = indicates yardage at which rifle is sighted in.
Specifications are nominal. Test barrels are used to determine ballistics figures. Individual firearms may differ from these test barrels statistics.
Specifications subject to change without notice.

TABLE XVIII

Winchester Shotshell Ammunition

SHORTSHELL SPECIFICATIONS.

Gauge	Symbol	Length of Shell In.	Powder Dram Equivalent	Oz. Shot	Standard Shot Sizes
SUPER-X GAME LOADS-MARK 5					
10	X10	2⅞	Max.	1⅝	4
12	X12	2¾	3¾	1¼	BB,2,4,5,6, 7½,9
16	X16H	2¾	3¼	1⅛	4,5,6,7½,9
20	X20	2¾	2¾	1	4,5,6,7½,9
28	X28	2¾	2¼	¾	6,7½
410	X410	2½	Max.	½	4,6,7½
410	X413	3	Max.	11/16	4,5,6,7½,9
SUPER-X MAGNUM GAME LOADS-MARK 5					
10	X10MG	3½ Mag.	4¼	2	2
12	X12HG	2¾ Mag.	Max.	1½	2,4,5,6
12	X12MG	3 Mag.	4	1⅝	2,4,6
12	X123G	3 Mag.	4	1⅞	BB,2,4
16	X16MG	2¾ Mag.	3¼	1¼	2,4,6
20	X20HG	2¾ Mag.	2¾	1⅛	4,6,7½
20	X20MG	3 Mag.	3	1¼	4,6,7½
SUPER DOUBLE X GAME LOADS-MARK 5					
10	X103XC	3½ Mag.	4½	2½	BB,2,4
12	X12XC	2¾ Mag.	Max.	1½	BB,2,4,6
12	X12MXC	3 Mag.	4	1⅝	4,6
12	X123XC	3 Mag.	4	1⅞	BB,2,4,6
20	X203XC	3 Mag.	3	1¼	2,4,6
SUPER-X STEEL SHOT LOADS					
10	X10SSM	3½ Mag.	Max.	1¾	BB,2
12	X12SSF	2¾ Mag.	Max.	1¼	BB,1,2,4
12	X12SSM	3 Mag.	Max.	1½	BB,1,2,4
20	X20SSM	3 Mag.	Max.	1	4

Gauge	Symbol	Length of Shell In.	Pellets Total	Buckshot Size
SUPER-X BUCKSHOT LOADS				
12	X12RB	2¾	9	00Buck
12	X12000B5	2¾	8	000Buck
12	X120B5	2¾	12	0Buck
12	X121B5	2¾	16	1Buck
12	X124B5	2¾	27	4Buck
16	X16B5	2¾	12	1Buck
20	X20B5	2¾	20	3Buck
SUPER-X MAGNUM BUCKSHOT LOADS				
10	X104B5	3½ Mag.	54	4Buck
12	X12B5	2¾ Mag.	12	00Buck
12	X123B5	3 Mag.	15	00Buck
12	X123000B5	3 Mag.	10	000Buck
12	X12M1B5	2¾ Mag.	20	1Buck
12	X1231B5	3 Mag.	24	1Buck
12	X12MB5	3 Mag.	41	4Buck

Gauge	Symbol	Length of Shell In	Powder Dram Equivalent	Oz. Shot	Standard Shot Sizes
UPLAND FIELD LOADS-MARK 5					
10	UW10BL	2⅞	8	Black Powder	Blank
12	UW12H	2¾	3¼	1⅛	4,5,6,7½,8,9
12	UW12P	2¾	3¼	1¼	6,7½,8
12	UW12BL	2¾	6	Black Powder	Blank
16	UW16H	2¾	2¾	1⅛	4,5,6,7½,8,9
20	UW20H	2¾	2½	1	4,5,6,7½,8,9
VALUE PACK GAME LOADS					
12	WW12D	2¾	3¼	1	7,8
12	WW12R	2¾	3¼	1	6
12	WW12PD	2¾	Max.	1¼	4,6,7
16	WW16D	2¾	2½	1	8
16	WW16R	2¾	2½	1	6
16	WW16PD	2¾	Max.	1⅛	6
20	WW20D8	2¾	2½	⅞	7,8
20	WW20PD	2¾	Max.	1	6,7
WESTERN FIELD TRIAL POPPER-LOAD®					
12	XP2FBL	2¾	—	—	Blank
AA PLUS TRAP LOADS					
12	WW12LAAP	2¾	2¾	1	8
12	WW12AAP	2¾	2¾	1⅛	7½,8
12	WW12MAAP	2¾	3	1⅛	7½,8
DOUBLE A INTERNATIONAL TRAP LOADS					
*12	WWIN12AH	2¾	3¼	1⅛	7½,8
13	WWIN12A	2¾	3¼	1⅛	7½,8

**Nickel plated shot*

Gauge	Symbol	Length of Shell In	Powder Dram Equivalent	Oz. Shot	Standard Shot Sizes
AA PLUS SKEET LOADS					
12	WW12LAAP	2¾	2¾	1	9
12	WW12AAP	2¾	2¾	1⅛	9
12	WW12MAAP	2¾	3	1⅛	9
20	WW20AAP	2¾	2½	⅞	9
28	WW28AAP	2¾	2	¾	9
410	WW41AAP	2½	Max.	½	9
DOUBLE A INTERNATIONAL SKEET LOAD					
12	WWAA121S	2¾	3½	1⅛	9
SUPER PIGEON TARGET LOADS					
12	WW12SP	2¾	3¼	1¼	7½,8

Gauge	Symbol	Length of Shell In.	Powder Dram Equivalent	Slug Wt. Oz.
SUPER-X HOLLOW POINT RIFLED SLUG LOADS				
12	X12RS15	2¾	Max.	1 oz. Rifled Slug
16	X16RS5	2¾	Max.	⅘ Rifled Slug
20	X20RSM5	2¾	Max.	¾ Rifled Slug
410	X41RS5	2½	Max.	⅕ Rifled Slug

TABLE XVIII, Continued

Norma Ballistics for Center Fire Pistol & Revolver Cartridges

Index no.	Cartridge	Bullet Weight grs.	Velocity, feet per sec.	Energy, foot pounds	Barrel length
			V Muzzle	E Muzzle	
	.32 ACP				
86	Full jacket round nose	77	900	139	4.0 inches
	.30 Luger				
88	Full jacket round nose	93	1230	312	4.7 inches
	9mm Luger				
91	Full jacket round nose	116	1165	350	4.7 inches
	.357 Magnum				
174	Soft point flat lead nose	158	1520	811	9.8 inches
	.38 SPL				
96	Lead wadcutter	148	770	195	6.0 inches
97	Lead round nose	158	870	266	6.0 inches
	.44 Magnum				
175	Soft point flat lead nose	240	1675	1496	18.5 inches

Norma Ballistics for Center Fire Rifle Cartridges

Index No.	Cartridge	Bullet Weight grs	Velocity, feet per sec.				Energy, foot pounds				Max. height of trajectory, inches		
			V Muzzle	V 100 yds.	V 200 yds.	V 300 yds.	E Muzzle	E 100 yds.	E 200 yds.	E 300 yds.	Tr. 100 yds.	Tr. 200 yds.	Tr. 300 yds.
	.220 Swift												
1	Soft point pointed	50	4111	3611	3133	2681	1877	1448	1090	799	.2	.9	3.0
2	Full jacket semi pointed	50	4111	3460	2850	2295	1877	1329	902	585	.2	.9	3.7
	.222 Rem.												
3	Soft point pointed	50	3200	2660	2170	1750	1137	786	523	340	.0	2.0	6.2
4	Full jacket semi pointed	50	3200	2610	2080	1630	1137	756	480	295	.0	2.1	7.1
	.243 Win.												
5	Hollow point	75	3500	3070	2660	2290	2041	1570	1179	873	.0	1.4	4.1
151	Soft point pointed	100	3070	2790	2540	2320	2093	1729	1433	1195	.1	1.8	5.0
148	Full jacket semi pointed	100	3070	2790	2540	2320	2093	1729	1433	1195	.1	1.8	5.0
	.244 Rem.												
7	Hollow point	75	3500	3070	2660	2290	2041	1570	1179	873	.0	1.4	4.1
8	Soft point pointed	90	3200	2850	2530	2230	2047	1624	1279	994	.1	1.6	4.9
	.250 Savage												
9	Soft point pointed	87	3032	2685	2357	2054	1776	1393	1074	815	.0	1.9	5.8
10	Soft point pointed	100	2822	2514	2223	1956	1769	1404	1098	850	.1	2.2	6.6
101	Soft point pointed	120	2645	2405	2177	1964	1865	1542	1263	1028	.2	2.5	7.0
	.257 Roberts												
11	Soft point pointed	100	2900	2588	2291	2020	1868	1488	1166	906	.1	2.1	6.2
12	Soft point pointed	120	2645	2405	2177	1964	1865	1542	1263	1028	.2	2.5	7.0
	6,5 Jap.												
13	Soft point pointed boattail	139	2428	2280	2130	1990	1820	1605	1401	1223	.3	2.8	7.7
14	Soft point round nose	156	2067	1871	1692	1529	1481	1213	992	810	.6	4.4	11.9
	6,5 × 54 MS												
15	Soft point pointed	77	3117	2731	2369	2036	1662	1274	960	710	.0	1.9	5.6
16	Soft point pointed boattail	139	2580	2420	2270	2120	2056	1808	1591	1388	.2	2.4	6.5
163	Full jacket boattail	139	2580	2420	2270	2120	2056	1808	1591	1388	.2	2.4	6.5
17	Soft point round nose	156	2461	2240	2033	1840	2098	1738	1432	1173	.3	3.0	8.2
164	Full jacket round nose	156	2493	2240	2033	1840	2098	1738	1432	1173	.3	3.0	8.2
	6,5 × 55												
105	Soft point pointed	77	3120	2730	2370	2040	1664	1275	961	712	.0	1.9	5.6
19	Full jacket pointed	93	3150	2705	2292	1920	2050	1512	1085	762	.0	1.9	6.0
20	Soft point pointed boattail	139	2789	2630	2470	2320	2402	2136	1883	1662	.1	2.0	5.6
21	Full jacket boattail	139	2789	2630	2470	2320	2402	2136	1883	1662	.1	2.0	5.6
22	Soft point round nose	156	2493	2271	2062	1867	2153	1787	1473	1208	.3	2.9	7.9
23	Full jacket round nose	156	2493	2271	2062	1867	2153	1787	1473	1208	.3	2.9	7.9
	.270 Win.												
24	Soft point pointed	110	3248	2966	2694	2435	2578	2150	1773	1448	.1	1.4	4.3
25	Soft point pointed boattail	130	3140	2884	2639	2404	2847	2401	2011	1669	.0	1.6	4.7
26	Hollow point boattail	130	3140	2860	2593	2338	2847	2362	1941	1578	.0	1.6	4.8
27	Full jacket boattail	130	3140	2944	2753	2568	2847	2502	2188	1904	.0	1.4	4.3
28	Soft point pointed boattail	150	2802	2616	2436	2262	2616	2280	1977	1705	.1	2.0	5.7
161	Full jacket pointed	150	2802	2616	2436	2262	2616	2280	1977	1705	.1	2.0	5.7

Norma Ballistics for Center Fire Rifle Cartridges, Continued

Index No.	Cartridge	Bullet Weight grs	Velocity, feet per sec.				Energy, foot pounds				Max. height of trajectory, inches		
			V Muzzle	V 100 yds.	V 200 yds.	V 300 yds.	E Muzzle	E 100 yds.	E 200 yds.	E 300 yds.	Tr. 100 yds.	Tr. 200 yds.	Tr. 300 yds.
	7×57												
29	Soft point pointed	110	3068	2792	2528	2277	2300	1904	1561	1267	.0	1.6	5.0
30	Soft point pointed boattail	150	2756	2539	2331	2133	2530	2148	1810	1516	.1	2.2	6.2
31	Full jacket boattail	150	2756	2539	2331	2133	2530	2148	1810	1516	.1	2.2	6.2
32	Soft point round nose	175	2490	2170	1900	1680	2410	1830	1403	1097	.4	3.3	9.0
	.30 US Carb.												
35	Soft point round nose	110	1970	1595	1300	1090	948	622	413	290	.8	6.4	19.0
34	Full jacket round nose	110	1970	1595	1300	1090	948	622	413	290	.8	6.4	19.0
	.30–30 Win.												
37	Soft point flat nose	170	2220	1890	1630	1410	1861	1349	1003	750	.7	4.1	11.9
	.308 Win.												
143	Soft point pointed boattail	130	2900	2590	2300	2030	2428	2937	1527	1190	.1	2.1	6.2
38	Soft point pointed boattail	150	2860	2570	2300	2050	2725	2200	1762	1400	.1	2.0	5.9
39	Soft point pointed boattail	180	2610	2400	2210	2020	2725	2303	1952	1631	.2	2.5	6.6
	.308 Norma Magnum												
179	Norma "Dual Core"	180	3100	2881	2668	2464	3842	3318	2846	2427	.0	1.6	4.6

Specifications of Winchester Primers

Centerfire Primers are recommended for use as follows:

SYMBOL	PRIMER	TYPE
W209	#209	Shotgun Shells
WLR	#8½–120	Large Rifle
WSR	#6½–116	Small Rifle
WSP	#1½–108	Small (Regular) Pistol
WLP	#7–111	Large (Regular) Pistol
WSPM	#1½M–108	Small (Magnum) Pistol
Large Rifle	30–40 Krag	444 Marlin
220 Swift	300 Win. Mag.	45–70 Gov.
22–250	300 H. & H. Mag.	458 Win. Mag.
225 Winchester	300 Savage	**Small Rifle**
243 Winchester	303 Savage	218 Bee
6mm Remington	303 British	22 Hornet
25–35 Winchester	307 Winchester	222 Remington
250 Savage	308 Winchester	222 Rem. Mag.
25–06	32 Win. Special	223 Remington
257 Roberts	32 Remington	25–20 Winchester
257 Roberts + P	32–40 Winchester	256 Win. Mag.
6.5 Rem. Mag.	8mm Mauser	30 Carbine
264 Win. Mag.	8mm Rem. Mag.	32–30 Winchester
270 Winchester	338 Win. Mag.	357 Rem. Max.
284 Winchester	348 Winchester	**Small (Reg.) Pistol**
7mm Mauser	35 Remington	25 Automatic
280 Remington	356 Winchester	30 Luger
7mm Express Rem.	358 Winchester	32 Automatic
7mm Rem. Mag.	350 Rem. Mag.	32 S & W
30–30 Winchester	375 Winchester	32 S & W Long
30 Remington	375 H & H Mag.	32 Short Colt
30–06 Springfield	38–55 Winchester	32 Long Colt
		32 Colt New Police
		9mm Luger
		38S & W
		38 Special
		38 Short Colt
		38 Long Colt
		38 Colt New Police
		38 Super-Auto
		38 Automatic
		380 Automatic
		Large (Reg.) Pistol
		38–40 Winchester
		41 Rem. Mag.
		44 Rem. Mag.
		44 S & W Special
		44–40 Winchester
		45 Colt
		45 Automatic
		45 Win. Mag.
		Small (Mag.) Pistol
		357 Magnum

Norma Ballistics for Center Fire Rifle Cartridges, Continued

Index No.	Cartridge	Bullet Weight grs	Velocity, feet per sec.				Energy, foot pounds				Max. height of trajectory, inches		
			V Muzzle	V 100 yds.	V 200 yds.	V 300 yds.	E Muzzle	E 100 yds.	E 200 yds.	E 300 yds.	Tr. 100 yds.	Tr. 200 yds.	Tr. 300 yds.
	.30–06												
40	Soft point pointed boattail	130	3281	2951	2636	2338	3108	2514	2006	1578	.1	1.5	4.6
42	Full jacket boattail	130	3281	2951	2636	2338	3108	2514	2006	1578	.1	1.5	4.6
43	Soft point pointed boattail	150	2972	2680	2402	2141	2943	2393	1922	1527	.0	1.9	5.7
44	Full jacket boattail	150	2972	2680	2402	2141	2943	2393	1922	1527	.0	1.9	5.7
45	Soft point pointed boattail	180	2700	2494	2296	2109	2914	2487	2107	1778	.1	2.3	6.4
46	Hollow point boattail	180	2700	2494	2296	2109	2914	2487	2107	1778	.1	2.3	6.4
47	Full jacket boattail	180	2700	2530	2365	2206	2914	2559	2236	1946	.1	2.2	6.1
48	Soft point round nose	220	2411	2197	1996	1809	2840	2358	1947	1599	.3	3.1	8.5
49	Full jacket round nose	220	2411	2197	1996	1809	2840	2358	1947	1599	.3	3.1	8.5
	.300 H & H												
50	Soft point pointed boattail	180	2920	2706	2500	2297	3409	2927	2499	2109	.0	1.9	5.3
51	Hollow point boattail	180	2920	2706	2500	2297	3409	2927	2499	2109	.0	1.9	5.3
53	Soft point round nose	220	2625	2400	2170	1986	3367	2814	2301	1927	.2	2.5	7.0
54	Full jacket round boattail	220	2625	2400	2170	1986	3367	2814	2301	1927	.2	2.5	7.0
	7.65 Argentine												
187	Soft point pointed	150	2920	2630	2355	2105	2841	2304	1843	1476	.1	2.0	5.8
	.303 Brit.												
55	Soft point pointed	130	2789	2483	2195	1929	2246	1780	1391	1075	.1	2.3	6.7
147	Soft point pointed	150	2720	2440	2170	1930	2465	1983	1569	1241	.1	2.2	6.5
56	Soft point pointed boattail	180	2540	2340	2147	1965	2579	2189	1843	1544	.2	2.7	7.3
57	Soft point round nose	215	2182	1947	1733	1541	2273	1810	1434	1134	.5	4.1	11.2
	7,7 Jap.												
110	Soft point pointed	130	2950	2635	2340	2065	2513	2004	1581	1231	.1	2.0	5.9
58	Soft point pointed boattail	180	2493	2292	2101	1922	2484	2100	1765	1477	.3	2.8	7.7
59	Soft point pointed round nose	215	2264	2023	1802	1603	2448	1954	1550	1227	.5	3.8	10.4
	8×57 JR												
61	Soft point round nose	196	2362	2045	1761	1513	2428	1820	1530	996	.4	3.7	10.6
	8×57 JRS												
62	Soft point round nose	196	2395	2074	1795	1535	2497	1873	1402	1026	.4	3.6	10.3
	8×57J												
112	Soft point round nose	159	2723	2362	2030	1734	2618	1970	1455	1062	.2	2.6	7.9
113	Full jacket round nose	159	2723	2362	2030	1734	2618	1970	1455	1062	.2	2.6	7.9
60	Soft point round nose	196	2526	2195	1894	1627	2778	2097	1562	1152	.3	3.1	9.1
114	Full jacket round nose	196	2526	2195	1894	1627	2778	2097	1562	1152	.3	3.1	9.1
	8×57 JS												
63	Soft point pointed	123	2887	2515	2170	1857	2277	1728	1286	942	.1	2.3	6.8
64	Soft point round nose	159	2723	2362	2030	1734	2618	1970	1455	1062	.2	2.6	7.9
65	Soft point round nose	196	2526	2195	1894	1627	2778	2097	1562	1152	.3	3.1	9.1
67	Hollow point boattail	198	2625	2416	2216	2028	3031	2567	2160	1808	.2	2.5	6.9
68	Full jacket boattail	198	2625	2456	2294	2139	3031	2653	2314	2012	.2	2.4	6.5
69	Soft point round nose	227	2330	2085	1855	1650	2737	2192	1735	1373	.4	3.4	9.5
	.358 Win.												
71	Soft point semi pointed	200	2530	2210	1910	1640	2843	2170	1621	1195	.4	3.1	8.8
72	Soft point semi pointed	250	2250	2010	1780	1570	2811	2243	1759	1369	.6	3.9	10.4
	.358 NORMA MAGNUM												
152	Soft point semi pointed	250	2790	2493	2231	2001	4322	3451	2764	2223	.2	2.4	6.6
	9,3×57												
73	Hollow point boattail	232	2329	2032	1763	1527	2795	2127	1602	1202	.4	3.7	10.6
74	Soft point round nose	286	2067	1818	1595	1404	2714	2099	1616	1252	.6	4.8	13.2
	9,3×62												
75	Hollow point boattail	232	2625	2304	2009	1742	3551	2735	2080	1564	.2	2.8	8.1
76	Full jacket pointed	232	2625	2350	2092	1855	3551	2846	2255	1773	.2	2.7	7.6
77	Soft point round nose	286	2362	2088	1837	1612	3544	2769	2144	1651	.4	3.5	9.8
78	Full jacket round nose	286	2362	2088	1837	1612	3544	2769	2144	1651	.4	3.5	9.8
	.375 H & H												
84	Soft point semi pointed	270	2740	2460	2210	1990	4502	3629	2929	2375	.2	2.4	6.5
85	Soft point semi pointed	300	2550	2280	2040	1830	4333	3464	2773	2231	.3	2.8	7.6

TABLE XVIII, Continued

Weatherby Ballistics for Center Fire Rifle Cartridges

BULLETS		VELOCITY feet per second				ENERGY foot pounds				MID-RANGE TRAJECTORY In Inches		
Weight	Type	Muzzle	100 yds.	200 yds.	300 yds.	Muzzle	100 yds.	200 yds.	300 yds.	100 yds.	200 yds.	300 yds.
.224 Weatherby Magnum:												
50	Pt-Ex	3750	3160	2625	2140	1562	1109	765	509	0.4	1.7	4.7
55	Pt-Ex	3650	3150	2685	2270	1627	1212	881	629	0.4	1.7	4.5
.257 Weatherby Magnum:												
87	Pt-Ex	3825	3290	2835	2450	2828	2087	1553	1160	0.3	1.6	4.4
100	Pt-Ex	3555	3150	2815	2500	2802	2199	1760	1388	0.4	1.7	4.4
117	Semi-Pt-Ex	3300	2900	2550	2250	2824	2184	1689	1315	0.4	2.4	6.8
.270 Weatherby Magnum:												
100	Pt-Ex	3760	3265	2825	2435	3140	2363	1772	1317	0.4	1.6	4.3
130	Pt-Ex	3375	3050	2750	2480	3283	2686	2183	1776	0.4	1.8	4.5
150	Pt-Ex	3245	2955	2675	2430	3501	2909	2385	1967	0.5	2.0	5.0
7MM Weatherby Magnum:												
139	Pt-Ex	3300	2995	2715	2465	3355	2770	2275	1877	0.4	1.9	4.9
154	Pt-Ex	3160	2885	2640	2415	3406	2847	2384	1994	0.5	2.0	5.0
.300 Weatherby Magnum:												
150	Pt-Ex	3545	3195	2890	2615	4179	3393	2783	2279	0.4	1.5	3.9
180	Pt-Ex	3245	2960	2705	2475	4201	3501	2925	2448	0.4	1.9	5.2
220	Semi-Pt-Ex	2905	2610	2385	2150	4123	3329	2757	2257	0.6	2.5	6.7
.340 Weatherby Magnum:												
200	Pt-Ex	3210	2905	2615	2345	4566	3748	3038	2442	0.5	2.1	5.3
250	Semi-Pt-Ex	2850	2580	2325	2090	4510	3695	3000	2425	0.6	2.7	6.7
.378 Weatherby Magnum:												
270	Semi-Pt-Ex	3180	2850	2600	2315	6051	4871	4053	3210	0.5	2.0	5.2
300	Semi-Pt-Ex	2925	2610	2380	2125	5700	4539	3774	3009	0.6	2.5	6.2
.460 Weatherby Magnum:												
500	R.N.	2700	2330	2005	1730	8095	6025	4465	3320	0.7	3.3	10.0

Federal Ballistics for Hi-Power Rim Fire Cartridges

Load Number	Cartridge	Bullet Type	Bullet Wt. in Grains	VELOCITY IN FT. PER SECOND		STRIKING ENERGY FT. LBS.		Mid-Range Trajectory in Inches — 100 Yard Range
				Muzzle	100 yds.	Muzzle	100 yds.	
701	.22 Short	Solid	29	1125	920	81	54	4.3
703	.22 Short	Hollow Point	27	1155	920	80	51	4.2
706	.22 Long	Solid	29	1240	965	99	60	3.8
710	.22 Long Rifle	Solid	40	1335	1045	158	97	3.3
712	.22 Long Rifle	Hollow Point	36	1365	1040	149	86	3.3
716	.22 Long Rifle	No. 12 Shot	—	—	—	—	—	—

Table XVIII, Continued

Federal Ballistics for Monark Rim Fire Cartridges

Load Number	Cartridge	Bullet Type	Bullet Wt. in Grains	VELOCITY IN FT. PER SECOND		STRIKING ENERGY FT. LBS		Mid-Range Trajectory In Inches—100 Yard Range
				Muzzle	100 yds	Muzzle	100 yds.	
702	.22 Short	Solid	29	1045	—	70	—	—
711	.22 Long Rifle	Solid	40	1145	975	116	84	4.0

Information is based on firing from a 24-inch barrel.
Mid-Range Trajectory shows the distance in inches that the projectile is above the line of sight at the midpoint of its 100 yard range.

Federal Ballistics for Center Fire Rifle Cartridges

Load No.	Cartridge	Bullet Wt. in Grains	VELOCITY feet per second				ENERGY foot pounds				BULLET DROP In inches			Test Barrel Length
			Muzzle	100 Yds.	200 Yds.	300 Yds.	Muzzle	100 Yds.	200 Yds.	300 Yds.	100 Yds.	200 Yds.	300 Yds.	
222A	**222 Remington**	50	3200	2660	2170	1750	1140	785	520	340	2.0	8.9	23.5	26
223A	**223 Remington**	55	3300	2800	2340	1930	1330	955	670	455	1.8	8.1	21.0	26
243A	**243 Winchester**	80	3500	3080	2720	2410	2180	1690	1320	1030	1.5	6.7	16.5	26
243B		100	3070	2790	2540	2320	2090	1730	1430	1190	2.0	8.4	20.0	
270A	**270 Winchester**	130	3140	2880	2630	2400	2840	2390	1990	1660	1.9	8.0	19.0	24
270B		150	2800	2440	2140	1870	2610	1980	1520	1160	2.4	11.0	26.5	
7A	**7mm. Mauser**	175	2490	2170	1890	1650	2410	1840	1390	1060	3.1	14.7	38.0	24
7B		139	2710	2440	2200	1980	2230	1810	1470	1190	2.1	11.7	36.5	
7RA	**7mm. Remington**	150	3260	2970	2700	2450	3540	2940	2430	1990	1.7	7.4	17.9	26
7RB	**Magnum**	175	3070	2720	2400	2120	3660	2870	2240	1750	2.0	8.8	21.5	
303OA	**30–30 Winchester**	150	2410	2020	1700	1430	1930	1360	960	680	3.4	15.0	38.5	26
303OB		170	2220	1890	1630	1410	1860	1350	1000	750	4.2	17.5	44.0	
3006A	**30–06 Springfield**	150	2970	2670	2400	2130	2930	2370	1920	1510	2.1	9.1	22.0	24
3006B		180	2700	2430	2180	1940	2910	2360	1900	1500	2.5	11.0	27.0	
300WA	**300 Winchester**	150	3400	3050	2730	2430	3850	3100	2480	1970	1.6	7.0	17.0	26
300WB	**Magnum**	180	3070	2850	2640	2440	3770	3250	2790	2380	1.9	8.1	19.5	
300A	**300 Savage**	150	2670	2390	2130	1890	2370	1900	1510	1190	2.6	11.5	27.5	26
300B		180	2370	2160	1960	1770	2240	1860	1530	1250	3.3	14.0	34.0	
303A	**303 British**	180	2540	2300	2090	1900	2580	2120	1750	1440	2.9	12.5	29.5	26
308A	**308 Winchester**	150	2860	2570	2300	2050	2730	2200	1760	1400	2.3	10.0	24.0	24
308B		180	2610	2250	1940	1680	2720	2020	1500	1130	2.8	12.5	31.0	
8A	**8mm. Mauser**	170	2500	2180	1900	1650	2370	1800	1360	1040	3.1	14.6	39.5	24
32A	**32 Win. Special**	170	2280	1920	1630	1410	1960	1390	1000	750	3.8	17.0	43.0	26
35A	**35 Remington**	200	2100	1710	1390	1160	1950	1300	855	605	4.6	21.0	55.0	22

Figures in this table are based on the barrel lengths shown in the last columns.

Federal Ballistics for Center Fire Pistol Cartridges

Load No.	Caliber	Bullet Type	Bullet Wt. in Grains	Muzzle Velocity Ft. Per Sec.	Muzzle Energy Ft. Lbs.	Mid-Range Trajectory 50 Yds.	Barrel Length
38A	**38 Special Mid-range (Match)**	Lead Wadcutter	148	770	195	2.1	6″
38B	**38 Special (Service)**	Lead	158	855	256	1.6	6″
45A	**45 Automatic (Match)**	Metal Case	230	850	370	1.6	5″
45B	**45 Automatic (Match)**	Metal Case Wadcutter	185	775	247	2.0	5″

Table XVIII, Continued

R.W.S. Ballistics for Center Fire Rifle Cartridges

Cartridge	Bullet Style	Bullet Weight (grains)	Time in Flight (in 1000th of sec.) at yards 110	220	330	Velocity (feet per sec.) Muzzle	110 yards	Energy (foot pounds) Muzzle	110 yards	Height of Trajectory in inches when zeroed at a given range — Iron sights (yards) 55	110	165	220	Telescope sights (yards) 55	110	165	220
6.5×54 M. Sch.	s.p. r.n.	159	161	344	555	2195	1910	1693	1288	+0.87 +2.17	0 +2.40	−3.54 0	−10.43 −5.70	+0.28 +1.38	0 +2.0	−2.95 0	−9.25 −5.31
6.5×54 M. Sch.	H-m.o. h.p.	159	149	317	506	2333	2072	1917	1519	+0.67 +1.73	0 +2.13	−3.15 0	−9.01 −4.81	+0.08 +0.94	0 +1.73	−2.56 0	−7.84 −4.41
6.5×57	s.p. r.n.	93	106	228	367	3320	2885	2255	1710	+0.04 +0.51	0 +0.94	−1.40 0	−4.25 −2.36	−0.55 −0.28	0 +0.55	−0.79 0	−3.07 −1.97
6.5×68S	s.p.S.	93	90	194	313	3937	3389	3183	2360	−0.04 +0.24	0 +0.55	−0.83 0	−2.64 −1.53	−0.63 −0.55	0 +0.16	−0.24 0	−1.46 −1.14
7×57 7×57R	H-m. l.p.	172.8	138	291	462	2526	2256	2452	1953	+0.51 +1.34	0 +1.65	−2.52 0	−7.36 −4.02	−0.08 +0.55	0 +1.26	−1.93 0	−6.18 −3.62
7×57 7×57R	s.p. r.n.	138.9	139	300	487	2561	2184	2025	1468	+0.55 +1.54	0 +1.85	−2.76 0	−7.87 −4.33	−0.04 +0.75	0 +1.46	−2.17 0	−6.70 −3.94
7×64	H-m.C. h.p.	172.8	123	255	398	2776	2567	2966	2532	+0.28 +0.94	0 +1.26	−1.93 0	−5.55 −2.99	−0.32 +0.16	0 +0.87	−1.34 1	−4.37 −2.60
7×64	s.p. h.p.	138.9	145	268	432	2913	2460	2618	1866	+0.35 +1.06	0 +1.42	−2.05 0	−6.18 −3.39	−0.24 +0.28	0 +1.02	−1.46 0	−5.00 −2.99
7×65R	s.p. r.n.	172.8	135	289	464	2616	2273	2633	1982	+0.47 +1.34	0 +1.61	−2.52 0	−7.28 −3.94	−0.12 +0.55	0 +1.22	−1.93 0	−6.10 −3.54
8×56 M.Sch.	s.p.	202.2	164	353	571	2164	1863	2105	1555	+0.90 +2.24	0 +2.64	−3.94 0	−11.30 −6.10	+0.32 +1.46	0 +2.24	−3.35 0	−10.12 −5.71
8×57JR	H-m. l.p.	196	141	300	479	2483	2187	2683	2083	+0.51 +1.41	0 +1.85	−2.76 0	−7.91 −4.25	−0.08 +0.63	0 +1.46	−2.17 0	−6.73 −3.86
8×57JR	s.p. r.n.	196	152	329	534	2345	1997	2394	1736	+0.71 +1.85	0 +2.32	−3.35 0	−9.64 −5.15	+0.12 +1.06	0 +1.93	−2.76 0	−8.46 −4.77
8×57 JRS	s.p. r.n.	196	149	323	521	2397	2037	2503	1808	+0.63 +1.69	0 +2.17	−3.23 0	−9.37 −5.08	+0.04 +0.90	0 +1.77	−2.64 0	−8.19 −4.68
8×68S	H-m.l.p.o. h.p.	186	108	234	379	3280	2808	4463	3269	+0.08 +0.59	0 +1.02	−1.49 0	−4.56 −2.56	−0.51 −0.20	0 +0.63	−0.91 0	−3.38 −2.17
9.3×62	H-m.C. h.p.	257.7	127	264	412	2697	2487	4159	3537	+0.35 +1.02	0 +1.38	−2.05 0	−5.94 −3.23	−0.23 +0.23	0 +0.98	−1.46 0	−4.77 −2.84
9.3×62	s.p. r.n.	285.5	152	326	524	2329	2017	3436	2582	+0.71 +1.69	0 +2.20	−3.19 0	−9.37 −5.08	+0.12 +0.90	0 +1.81	−2.60 0	−8.19 −4.68
9.3×74R	s.p. r.n.	285.5	154	331	531	2297	1987	3342	2503	+0.71 +1.85	0 +2.20	−3.35 0	−9.72 −5.28	+0.12 +1.06	0 +1.81	−2.76 0	−8.54 −4.88
9.3×74R	H-m. l.p.	257.7	133	282	447	2613	2329	3913	3103	+0.43 +1.22	0 +1.58	−2.36 0	−6.85 −3.74	−0.16 −0.43	0 −1.18	−1.77 0	−5.67 −3.35

TABLE XVIII, Continued

D.W.M. Ballistics for Center Fire Rifle Cartridges

Cartridge	Bullet Style	Bullet Weight grs.	Time of Flight 1/1000 sec. for yds. 100	200	300	Velocity feet per sec. Muzzle	100 yards	Energy foot pounds Muz. zle	100 yards	Path of Bullet in inches above or below line of front and rear sight 50	100	200	300	Telescope 50	100	200	300
5.6×52R	soft pt.	71	120	250	380	2840	2430	1270	930	+0.2	0	−5.7	−17.4	−0.4	0	−4.5	−15
22HP	solid pt.									+1.5	+2.8	0	− 8.9	+0.6	+2.2	0	− 8.3
6.5×57	soft pt.	93	100	210	340	3310	2820	2260	1640	+0.1	0	−3.6	−13.1	−0.5	0	−2.4	−10.7
6.5×57R	solid pt.									+0.9	+1.8	0	− 7.7	0	+1.2	0	−7.1
7×57	soft pt.	139	130	270	430	2550	2230	2010	1540	+0.5	0	−6.7	−22.4	−0.1	0	−5.5	−20
7×57R	solid pt.									+2.2	+3.5	0	−12.3	+1.3	+2.9	0	−11.7
7×64	Brenneke	162	110	230	360	2940	2620	3110	2470	+0.1	0	−4.4	−14.4	−0.5	0	−3.2	−12
Brenneke	soft pt.									+1.2	+2.1	0	− 8.3	+0.3	+1.5	0	− 7.7
8×56	soft pt.	200	150	320	520	2180	1850	2110	1510	+0.9	0	−4.9	−32.6	+0.3	0	−3.7	−30.2
M. Sch.	round pt.									+3.5	+5.1	0	−17.3	+2.6	+4.5	0	−16.7
8×57JS	soft pt.	196	120	260	420	2720	2310	3220	2320	+0.4	0	−6.2	−20.8	−0.2	0	−5	−18.4
	solid pt.									+2	+3.1	0	−11.5	+1.1	+2.5	0	−10.9
8×57JRS	soft pt.	196	130	280	450	2480	2140	2680	1980	+0.4	0	−7.7	−25.3	−0.2	0	−6.5	−22.9
	solid pt.									+2.8	+4	0	−13.3	+1.9	+3.4	0	−12.7
8×60S	soft pt.	196	120	260	400	2580	2160	2900	2030	+0.4	0	−6.7	−22.5	−0.2	0	−5.5	−20.1
	solid pt.									+1.6	+3.4	0	−12.4	+0.7	+2.8	0	−11.8
9.3×74R	Soft pt.	285	142	303	490	2330	1980	3460	2490	+0.3	0	−8.1	−27.4	−0.3	0	−6.9	−25
	solid pt.									+2.3	+4.1	0	−16.6	+1.4	+3.5	0	−16

Table XIX

LEAD SHOT

It appears that the earliest firearms were loaded with most anything that could be poured down a barrel, over a powder charge. Stones and pebbles probably gave way to metallic fragments and, eventually, to lead that was roughly cast into random-sized spheres. Grape shot, as the latter was referred to, is first mentioned in records dating to the early fifteenth century.

It is logical to assume that at about that time someone decided that a single large round ball held some advantage over multiple small and erratically flying projectiles and, when he found it difficult to fit such a single projectile to a given bore size, he simply wrapped it in paper or cloth to achieve the powder seal required for reasonable performance.

Shotguns were called "fowling pieces" in those days and there persisted a need for multi-projectile guns. Gunmakers thus sought to improve performance by turning their attention to the shot itself. They quickly found that molten lead poured through a sieve resulted in a round though slightly tear-shaped ball and that they could attain assorted sizes by simply varying the sizes of the holes in the sieve. Someone then determined that the pointed tail of the teardrop could be removed by tumbling the shot in a drum. Small amounts of arsenic, added to the molten lead, was found to serve two purposes: it raised the temperature of the molten lead, helping fluidity, while simultaneously hardening the shot somewhat so that it resisted deformation in the bore.

The amount of arsenic employed rarely exceeded one-half of one per cent.

These manufacturing methods survived until 1818 when an Austrian discovered a faster process that resulted in near perfect shot; he poured the molten lead through a sieve at the top of a tower, permitting the droplets to fall into a water-filled catch basin at ground level. The long drop and slow cooling tended to round the shot and eliminate the need for subsequent tumbling. Shot towers ranged up to 300-feet in height and many are still functioning today. Remington's shot tower in Bridgeport, Connecticut, has become a familiar landmark.

Experimenters next discovered that antimony would also aid the arsenic-lead alloy and result in harder shot, though only small amounts could be used. . . . rarely more than 3% of the mix.

Even when sieve aperatures are of a uniform size, they do not produce one given size of shot. A sieve made to drop #6 shot, for example, will invariably form a substantial percentage of shot smaller and larger than the number six .11 inches in diameter. For this reason, shot makers sort the finished shot in a series of slightly cone-shaped perforated strainers.

While most lead shot is still produced by the traditional tower method, two other techniques have been developed over the years and are employed today. The first of these uses a rapidly spinning disc: molten lead is dropped on the disc and is spun off against the walls of the tank before rolling down into a water-filled basin. The second employs a sloping board covered with a thin film of water and located only a foot or so beneath a perforated trough. Molten lead droplets fall from the trough and land on the board where the water and hot lead combine to create a vapor cushion around the individual pellet, rounding it nicely as it rolls across the board and into the water tank.

The final step in shot-making is to coat the shot and graphite is generally employed for this purpose to prevent oxidation. At times, too, copper or nickel have been used to coat shot for special purposes.

Actual sizes of lead shot

NO.	9	8½	8	7½	6	5	4	2	1	BB
SHOT SIZES	•	•	•	•	•	•	•	•	•	•
Diameter in inches	.08	.085	.09	.95	.11	.12	.13	.15	.16	.18

BUCKSHOT	No. 4	No. 3	No. 2	No. 1	No. 0	No. 00
Diameter in inches	.24	.25	.27	.30	.32	.33

Suggested shot sizes for hunting

Game	*Shell*	*Shot Size*
Ducks	Hi-Vel	#4,5 or 6
Geese	Hi-Vel	#BB,2, or 4
Pheasant	Hi-Vel	#5 or 6
Grouse, Partridge	Std. or Hi-Vel	#5,6,7½ or 8
Dove	Std. or Hi-Vel	#6,7½ or 8
Quail	Std. Vel	#7½,8 or 9
Woodcock	Std. Vel	#7½,8 or 9
Squirrels	Hi-Vel	#5 ot 6
Rabbit	Std. or Hi-Vel	#4,5 or 6
Turkey	Hi-Vel	#BB,2 or 4
Fox	Hi-Vel	#BB, 2
Deer, Bear	Hi-Vel	Buckshot or Slug

Percentage of Shot in a 30″ Circle at 40 Yards

Cylinder bore	25 to 35%
Skeet #1	35 to 45%
Skeet #2	45 to 55%
Improved Cylinder	45 to 55%
Modified	55 to 65%
Improved Modified	65 to 70%
Full	70 to 80%
Extra Full	80% or more

Note: Percentage rules are not rigid. Skeet #2 chokes can exceed 55% and modified chokes often throw close to 70% patterns, depending upon the ammo used. Cylinder bore patterns are largely dependent upon the bore diameter of a given barrel.

Composition of Big Game Shells

	Powder Charge equivalents	*Lead Charge*
	Slugs	
12 gauge slug	3¾ drams	1 oz. slug
16 gauge slug	3 drams	⅞ oz. slug
20 gauge slug	2¾ drams	⅝ oz. slug.
410 gauge slug	(maximum)	⅕ oz. slug
	Buckshot	
12 gauge	3¾ drams	00 Buck (9 pellets)
12 gauge	3¾ drams	0 Buck (12 pellets)
12 gauge	3¾ drams	1 Buck (16 pellets)
12 gauge	3¾ drams	4 Buck (27 pellets)
16 gauge	3 drams	1 Buck (12 pellets)
20 gauge	2¾ drams	3 Buck (20 pellets)

Quantity of Pellets per Given Weight of Shot Lead

Shot Size	Diam. Of Pellet	Approximate Number of Pellets per Charge										
		½ oz.	11/16 oz.	¾ oz.	⅞ oz.	1 oz.	1⅛ oz.	1¼ oz.	1½ oz.	1⅝ oz.	1⅞ oz.	2 oz.
BB	.18	25	34	38	44	50	56	62	75	81	94	100
2	.15	45	62	68	79	90	101	112	135	146	169	180
4	.13	68	93	101	118	135	152	169	202	219	253	270
5	.12	85	117	128	149	170	191	212	255	276	319	340
6	.11	113	155	169	197	225	253	281	337	366	422	450
7½	.095	175	241	262	306	350	394	437	525	569	656	700
8	.09	205	282	307	359	410	461	512	615	666	769	820
9	.08	292	402	439	512	585	658	731	877	951	1097	1170
12	.05	1192	1640	1789	2087	2385	2683	2981	3577	3876	4472	4770

To use this chart, determine the shot size and the weight of the charge found in a particular shotshell, and read the corresponding pellet count from this table. For example— a charge of 1⅛ ounces of size 7½ shot consists of approximately 394 pellets. Count the number of pellets that have penetrated the area in question and divide that figure by the load count to determine pattern percentage, i.e., using 1⅛ ounces of #7½ shot 276 holes are counted in the pattern area. Divide 276 by 394 to arrive at a percentage of 70.

TABLE XX

Damascus Barrels

Damascus barrels were made by winding two or more yellow-hot strands of iron or steel around a barrel-shaped core (called a mandrel) and hammer forging the strips to join them in a seamless fashion. The mandrel was then removed leaving a pipe-like tube. This blacksmithing technique was probably developed in the middle East during the 1500's. By the time it was replaced — in the late 1800's — the practice of making "Damascus barrels" had spread throughout the world and, as one might suspect, the quality of an individual tube could be expected to range from poor to excellent.

Initially Damascus barrels were made solely from strips of iron. When it was found that a small quantity of carbon would turn iron into steel, barrel makers alternated strips of iron and steel. Eventually only steel was employed by the better makers.

Fine barrel specimens invariably evidenced a very uniform and decorative geometric pattern in their external finishes. These became so well known to shooters that they served to identify the region, if not the maker, from which a given barrel originated. By the late 1800's, quality barrels had earned such respect and confidence that makers of far superior fluid steel barrels were hard-pressed to compete and often were forced to apply Damascus-styled decals to their wares. The market acceptance of steel barrels came about slowly. So slowly, that one wonders how long it would have taken if the introduction of smokeless powders hadn't rendered the Damascus barrel completely obsolete. To this day there are found considerable numbers of fine old guns having Damascus tubes. Under no circumstances should these be used with modern smokeless powder ammunition.

At various times and in various places Damascus barrels were called by other names, such as band barrels, laminettes, laminated steel, and twist barrels.

Damascus barrels were made from strips of steel, heated, twisted and welded together through hammering. Patterns resulted in the finished surface, such as shown in this artist's rendering. Damascus barreled guns cannot be used with modern shotshells.

TABLE XX
Gun Lock Development

("Lock" is the term used to describe the firing mechanism of a firearm.)

In its earliest form, the firearm was activated by means of a flaming stick, or rope, which was applied to a small, powder-filled access hole in the breech area of the barrel. Because a source of fire was vital to the method, early firearms had little portability, to say nothing of the handicaps caused by wind and rain. Historians believe that a glowing hot wire represented the first improvement in the system. When poked directly into the touchhole, the hot wire could reach the propellant charge, eliminating the need for separate powder-filling of the touchhole. The wire, too, tended to remain hot and was easier to shield from the weather. By this means, portability of the firearm was slightly improved but there remained the biggest problem — aiming the weapon while simultaneously trying to guide a glowing wire into the tiny touchhole. There's no doubt that early firearms were operated by two-man teams.

Finally in 1411, the first "lock" mechanism was invented. This was equipped with a crude form of trigger and a spring-powered arm that held a glowing wick. When the trigger was pulled, the arm was forcefully swivelled so that the glowing wick was deposited unerringly into the priming charge of the flashpan. The mechanism was called a "matchlock" and, for the first time one man could handle it efficiently, concentrating on his aim and appropriate trigger timing. Between shots, obviously, the shooter had to blow on the wick to keep it glowing.

For the next 106 years the matchlock underwent continuous modification without significant improvement until 1517, when Kiefuss invented the wheellock — a design that was to reign in German language areas for close to two hundred years. In fact, some present day firearms experts feel that the wheellock had a lower misfire rate and that it was more reliable than the flintlock that replaced it. The flintlock, though, was undoubtedly faster to load and fire.

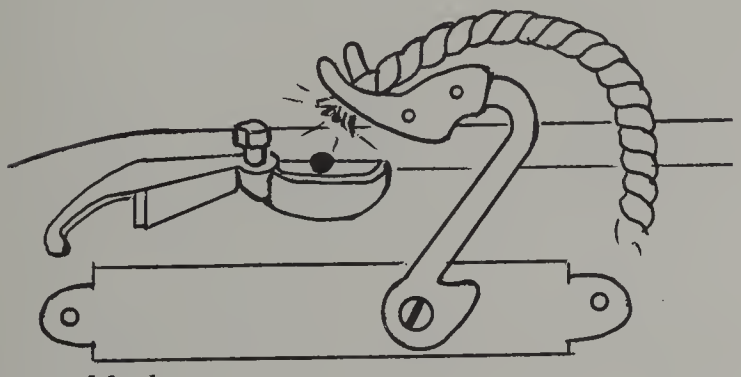
The wheellock was designed with a serrated wheel operated by means of a bicycle-type chain and a powerful spring. After loading the barrel, the shooter would fill the flashpan and cover it with a manually operated sliding lid. Then, with a socket-type key, he'd wind the mechanism to tension the wheel's spring. The wheel, incidentally, was recessed into the underside of the pan so that its serrated edge was actually covered by the priming charge. A separate arm, containing a cock and a carefully shaped piece of iron pyrites, resembled a hammer but did not function in the usual manner. To fire the wheellock, the shooter had to uncover the flashpan and manually lower the arm so that its spring would keep the pyrites in contact with the edge of the wheel. A subsequent pull on the trigger spun the wheel rapidly

against the pyrites creating a strong sparking action. Since this took place within the priming charge, it is felt to have been rather reliable.

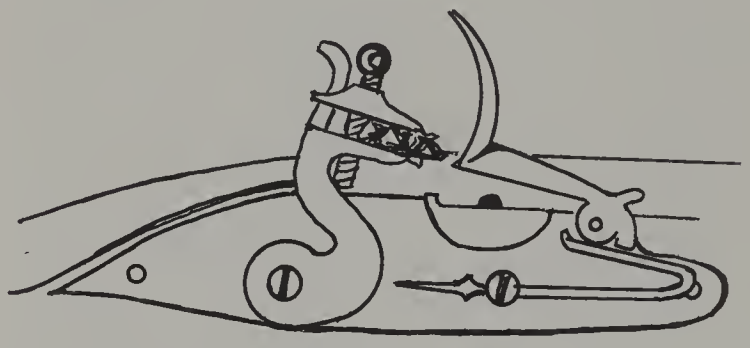
Ironically, the forerunner of the flintlock — called the "snaphaunce" — followed roughly thirty years later but it had a striker and pan cover as two separate components and both had to be manually operated. The "Miquelet lock" improved upon the design of the snaphaunce by spring loading the striker ("frizzen") and by combining the striker with the pan cover. Nevertheless, the flintlock, as we know it, was designed by Marin Le Bourgeoys of France, about 1615.

After loading the barrel in the usual manner, the flintlock shooter placed a small charge of powder in the flashpan, so that it partially covered the flashhole. Then he snapped the striker down so that its integral pan cover enclosed the priming charge. The hammer was then drawn back to the full cock position. Upon pulling the trigger, the hammer would swing forward forcefully and the flint would strike the frizzen, directing a shower of sparks into the pan as the striker was pushed out of the way. One of the biggest drawbacks with this system was that the flint had to be changed often.

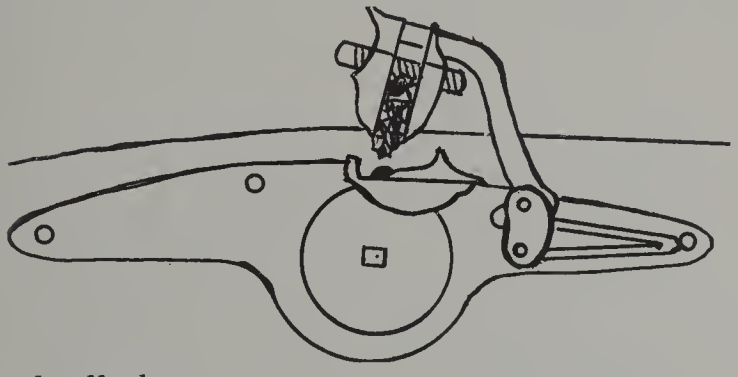
The first percussion lock came about when Shaw, of England, invented the percussion cap in 1816, the development that led to modern rimfire and centerfire ammunition in the 1850's and which made breechloaders truly practical. Unfortunately, a large number of fine flintlocks were converted to the percussion system in the early 1800's: (Gunsmiths had only to remove the flashpan, equip the flashhole with a bolster and nipple and change the hammer to accomplish this task.) Collectors, today, are often disappointed to find an otherwise valuable flintlock diminished in value by this conversion.



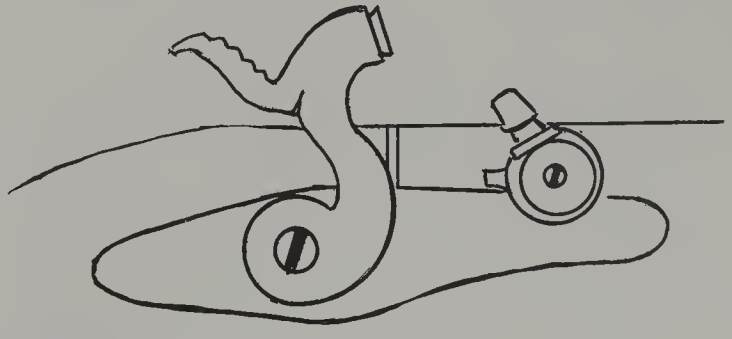
matchlock



flintlock



wheellock



percussion lock

TABLE XXI

STOCK TYPES AND MEASUREMENTS

The average production made shotgun is equipped with a stock having a fourteen inch length of pull, a one and a half inch drop at comb and a two and a half inch drop at heel. Field models are generally pitched at about three inches and, if foreign made, they'll have a cast-off ranging from ⅛th to ¼" of an inch. American shotgun stocks are generally made without a cast. For someone standing 5'10" and weighing about 170 lbs. these dimensions are about ideal. However, anyone taller or shorter, unusually thin or heavy, or having distinctive facial, neck or arm features will have difficulty with the standard stock and should opt to buy guns with stocks made to order. One must bear in mind that wing-shooting (shotgunning) has a spontaneous quality and that the shooter doesn't have the opportunity to adjust to a stock that doesn't fit him perfectly. Rifle shooters, on the other hand, generally have time to aim more deliberately and will automatically compensate for slight mis-fitting. Nevertheless, the rifleman who hunts in heavy growth areas would be wise to borrow a note or two from the shotgunner, adopting stock-fitting tactics for his form of "snap shooting."

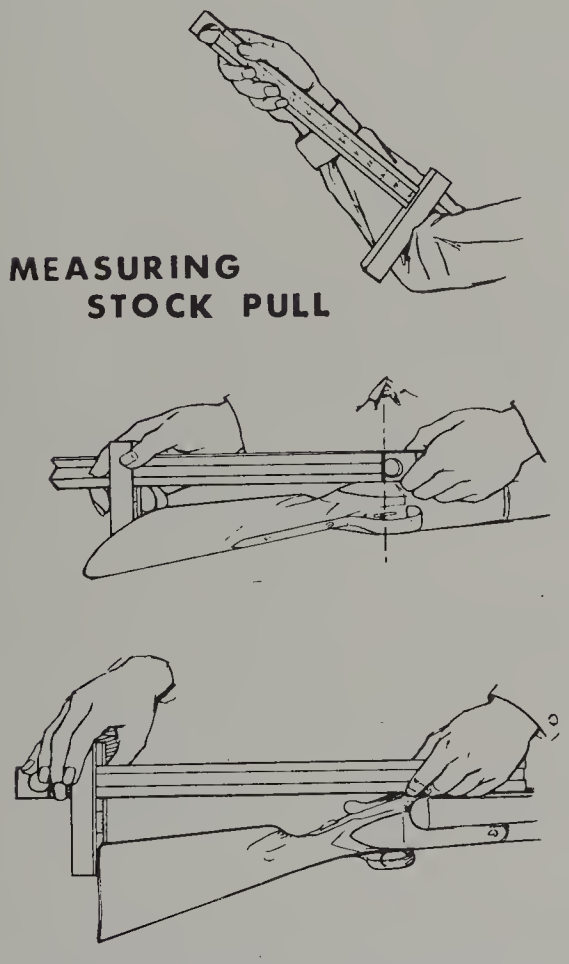
Shotguns made with custom-fitted stocks usually approach $1,000 in cost but are the best investment a wingshooter can make because the shotgun will rarely decline in value. When it does, it's usually due to a particular shooter's outlandish physical dimensions and stock requirements. It is also possible to re-equip an existing pet shotgun with custom-fitted wooden components but the shooter must be careful to deal with a highly knowledgeable stock maker or, have his dimensions determined by someone who is an expert in fitting stocks so that he can furnish the measurements to a custom stock carver. Unfortunately, there are very few men remaining in the U.S. who are truly expert in this area. When it is impossible to determine measurements beforehand, the shooter should write to a custom stock maker and furnish all of his dimensions; a good stock carver can often translate actual dimensions into a close fit. Following are the dimensions sought by the stock maker:

Height and weight
Face — broad, narrow or average
Neck — short, long or average
Eyes — distance between pupils
Trigger finger — distance from knuckle to crease in first tip
Arm length — from armpit to first crease in trigger finger
Length of pull — (the most important dimension in stock fitting)

Attired in proper shooting clothing, stand erect with the upper arm (of the trigger hand) pressed against the side of the body.

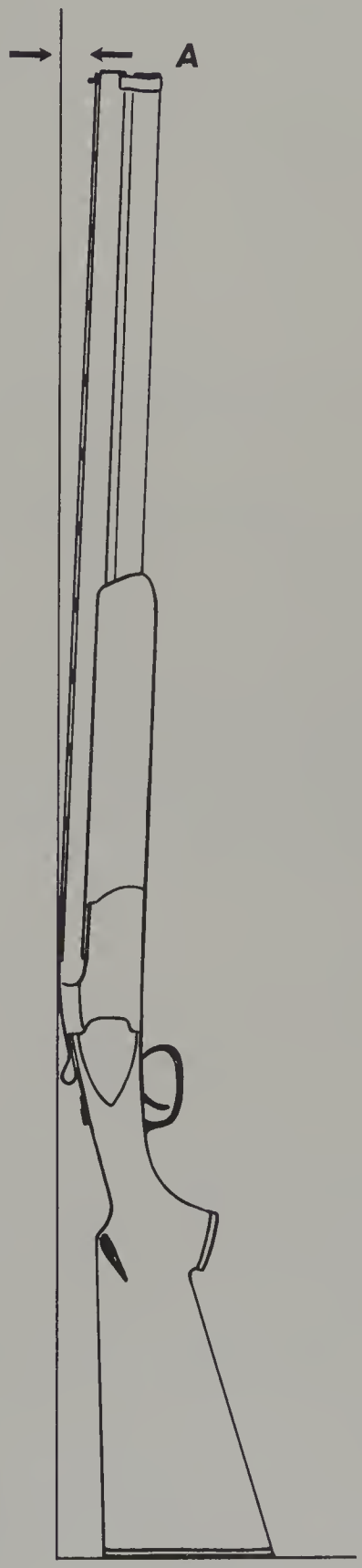
Then raise the forearm so that it is extended at a 90° angle with the trigger finger pointing forward. Measure from the joint of the elbow to the first crease near the tip of the trigger finger and deduct ¼-inch from this measurement.

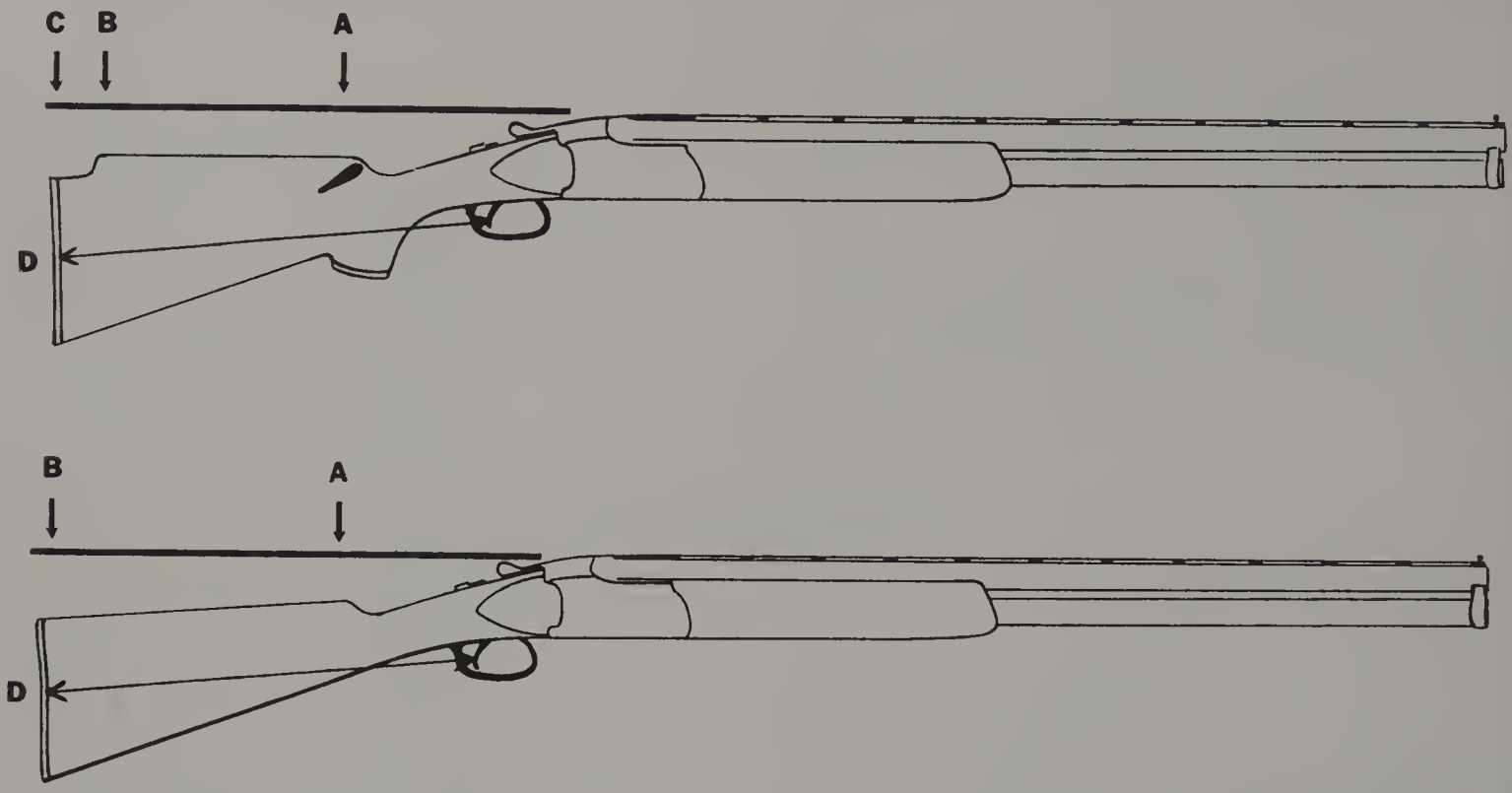
The best method for determining stock measurements, by far, is to be tested with a "try gun" but these are rarely encountered in the U.S.



Measuring length of pull and drop at heel with Bob Brownell's "Pull & Drop Gauge."

If the butt of the gun is placed flat on the floor, and the shotgun located against a vertical wall so that the topmost point of the receiver makes contact, the "pitch" can be determined by measuring the distance between the muzzle and the wall at point "A." Generally speaking, trap guns have a small pitch—sometimes as little as one inch or less. Skeet guns range between two and three inches and field guns can have a pitch of 3½" when shooter's physical dimensions demand it.





Length of pull ("D" in diagrams) is the most critical dimension in stock fitting. Comb dimensions are next most important. Assuming the sight line is continued at the same level over the buttstock, in the above diagrams "A" shows where the measurment is taken for "drop at comb," "B" represents the location for "drop at heel," and "C" indicates the position for measuring "drop at Monte Carlo."

Models containing more than one trigger have length of pull determined from the forward-trigger.

Some shooters would also be fussy about the grip location in pistol grip stocks, furnishing a measurement for the spacing between the bottom-leading edge of the grip to the center of the trigger. (Note that lower diagram illustrates an English-style straight grip stock.)

TABLE XXII

Notable Dates in Firearms History

c — abbreviation for circa (about)

c1200 *gunpowder*, believed first compounded early in 13th century

1248 *gunpowder,* first authentic record of its existence by Bacon of England

1313 *gunpowder*, first recorded use as a propellent for a cannon projectile

c1324 *hand held firearm,* with a cannon lock known to be in use

1339 *multi-barrel* arrangement used to fire several cannons simultaneously, the predecessor of the machine or Gatling gun

c1350 *gunpowder,* use in cannon experimented with by Berthold Schwartz (1310–1384) a German monk, often erroneously credited with the invention of gunpowder

1386 *hand gun*, first use of the term found in English records

1411 *matchlock*, first authentic record of its existence

c1450 *gun lock,* a mechanical means attached to a gun for applying match to powder
corned powder supplanted serpentine powder

1475 *matchlock,* appeared with levers, springs and short sear

1498 *rifled gun barrels* with straight grooves by Kollner of Vienna

c1500 *button lock* an improved form of matchlock

c1517 *wheellock* said to have been invented by Kiefuss in Nuremburg or Vienna

c1521 *pressure lock* an improved form of matchlock

1550–1570 *snaphaunce,* first firearm to use striking action of the cock and flint to generate sparks

c1570 *snap lock,* also called "tinder lock" or "tube lock" came into use

c1575 *cartridges* of paper containing ball and powder in use

c1600 *miquelet lock and English lock* made appearance

1608 *telescope* invented by Lippershey of The Netherlands

c1615 *flintlock invented* by Marin le Bourgeoys of France

1629 *game law,* Virginia first of colonies to pass a game law

1639 *gunpowder mill,* grant of 500 acres of land made to Edward Rawson in the American Colonies for construction of a gunpowder mill.

1662 *detonation,* principle of, known to British

1690 *Brown Bess* officially adopted by British

1700 *flintlocks* being produced in the American Colonies with both smooth bore and rifled barrels

1730 *breech loading flintlocks* known to have existed but not in general use

c1760 *flintlock grenade launcher* made in Tower of London Armory to fire a spherical grenade

1776 *breech loading flintlock* of improved form

invented by Ferguson of England

1778 *Springfield Armory* established as an ammunition laboratory in Springfield, Massachusetts

1790 *Seven barrel flintlock* made with ignition system whereby one stroke of flint ignited a powder train and all seven barrels fired within one minute

1793 *detonating powders* experimented with by Rev. Alexander John Forsyth, a Presbyterian minister of Scotland

1795 *muskets,* manufacture of began at Springfield Armory

1796 *game law,* first Federal, passed May 19th by Congress

1801 *duelling,* Tennessee first state to pass a law dealing with duelling

1807 *pill lock* using detonating pellets patented by Forsyth of England

1808 *paper fulminate device* detonated by piercing with needle, by Pauly of Switzerland

1811 *breechloader*, first fairly successful design, by Hall of the U.S.

1816 *copper percussion cap,* by Shaw of England, *copper tube primer,* by Manton of England

1818 *flintlock revolver,* a single action flintlock gas sealed repeater patented by Collier of the U.S.

1822 *lathe* for duplicating irregular shapes, by Blanchard of the U.S.

1825 *Deringer,* first pistol produced using new percussion cap, by Deringer of the U.S.

1835 *revolver,* first practical one to rotate cylinder by cocking hammer, by Colt of the U.S.

1836 *pinfire cartridge,* first to provide successful combination of breech loading cartridge and gun with true breech seal, by Le Faucheux of France

1837 *bolt action,* first really successful one in production, by Dreyse of Germany

1838 *nitric acid* action on cotton, recognized by Pelouze

1845 *nitrated cotton* as explosive recognized by Schonbein of Germany
paper tape primer developed by Maynard of the U.S.
rimfire caps like BB cap, by Flobert of France
popular pepperbox pistol patented by Ethan Allen of the U.S.

1846 *nitroglycerin* by Sobrero of Italy

1848 *breechloading* percussion system, most famous and successful, by Sharps of the U.S.

1849 *repeating rifle,* first reasonably successful, by Jennings of the U.S.

1851 *solid frame revolver,* first successful one patented in England by Robert Adams
steel gun, first all steel gun exhibited by Alfred Krupp of Germany

1852 *disc primer* by Sharps of the U.S.

1855 *revolver* combining single and double action hammer system patented in England
revolver with bored through cylinders patented by White of the United States

1856 *steel manufacturing* process by Bessemer of England

1857 *rimfire cartridge,* first really practical one in production, by Smith and Wesson
center fire cartridge, initiator of modern development patented in France

1858 *center fire cartridge* improved by Morse of the U.S.

c1860 *game preserve,* first in the U.S., a private preserve by Judge John Dean Canton of Ottawa, Illinois

1860 *repeating rifle,* first really successful, by Spencer of the U.S.
Boxer primer by Boxer of England

1861 *center fire cartridge,* first one widely used, patented in England, by Schnieder of France

1862 *machine gun*, first successful mechanical, manually operated, by Gatling of the U.S.

1863 *smokeless powder* by Shultze of Germany

1864 *hunting license fee,* first required by law in the U.S., by New York State

1866 *dynamite* by Nobel of Sweden

1870 *Berdan primer* by Berdan of the U.S.

1871 *The National Rifle Association* formed in New York City with 35 members

1872 *Peacmaker,* Colt single action revolver, first put into production

1873 *Shooting meet,* first held by The National Rifle Association

1878 *bolt action magazine arm,* (by Hotchkiss), first to be adopted by U.S.

1880 *clay pigeon target* patented in U.S. by George Likowsky of Cincinnati, Ohio

1883 *machine gun*, first truly successful automatically functioning firearm, by Hiram S. Maxim of the U.S.

1885 *smokeless powder* improved by Vieille of France

1888 *ballistite,* first of type having nitrocellulose dissolved in nitroglycerin

1889 *revolver* with swing-out cylinder introduced by Colt

1890 *fully automatic shooting gallery,* first one in the U.S. invented by Charles Wallace Parker of Abilene, Kansas

1891 *alloy steel* by Harvey of the U.S.

1892 *self loading pistol,* first practical, by Schonberger

1893 *trap shooting meet,* first in the U.S. at Jamaica, New York; live birds used
semiautomatic pistol, first in production in Germany, by Borchardt of the U.S.

1895 *automatic arm,* first successful gas-piston operated, by Hotchkiss Company

1898 *semi-automatic pistol*, toggle action, patented by Luger of Germany

1900 *trap shooting,* first with clay pigeons at Queens, New York
International Revolver Tournament, first, between U.S. and French teams, held as to each team in Greenville, New Jersey and Paris, France, respectively, the U.S. team won

1901 *high speed alloy steel,* by Taylor and White of the U.S.
machine gun, water-cooled, short recoil operated, patented by J.M. Browning of the U.S.

1906 *thermosetting man-made plastic,* patented by Dr. Leo Hendrik Baekeland of the U.S.

1909 *silencer* by H.P. Maxim of the U.S.

1916 *stainless steel* by Brearly of England

1926 *Garand rifle* patented by John C. Garand of the U.S.

1930 *firearms identification,* first scientific research and instructional laboratory for forensic ballistics opened in the U.S. at Northwestern University

1937 *game preserves,* first Federally authorized in the U.S.

1955 first successful rapid shotshell reloading press (for handloaders) developed by Puth of U.S.

1965 first rocket-powered small arm developed by MBA Associates of San Ramon, California, and called the "Gyrojet."

1969 first case-less ammunition introduced by Daisy-Heddon Co. in the U.S.

c1970 metallic silhouette target shooting introduced into the U.S. from Mexico.

TABLE XXIII
U.S. Registered Trademarks and Trade Names

Under conditions prescribed by Federal Law, trademarks may be registered in the United States Patent Office where they are grouped in "classes" according to the nature of the goods to which they are applied. Class 9 embraces "Explosives, firearms, equipments and projectiles." Following are listed trademarks in Class 9 encountered in the firearms art.

Copies of registered trademarks may be obtained from Patent Office, Washington, D.C. 20231 for a token fee.

AA (and design)
AA Inc.
Accuracy Is Our Aim
Accu-Range
Accu-Riser
Ace
Ac-Kro-Gruv
Acme
Acraglas
Adjustomatic
Aero-Dyne Super Poly Choke
Aeromet
Aetna
AG
Agent
Ajax
Aquirre y Aranzabal
AI
Aimpoint
Air-O-Matic
Airsearch
Air-Wedge
Airweight
AL
Aldenbilt
All Rubber Slip On
Altite
American Eagle
American 50
Amron
Amwal
Anschutz
Anti-Flinch
AR-15
Armalite
Arrow
Arrow Express
Arrow-Matic
Astra
Austin
Auto-Disk
Autogun
Auto-Index
Auto Master
Auto-Ord-Co (and design)
Autopistol (and design)
Autorifle (and design)
AYA

B (and design)
Bakelite
Ballistite
Ball Powder
Bankers Special
Bar-O
Bar-V
Bayard
Belknap
Benjamin
Benjamin Franklin
Beretta
Berns-Martin
Bethlehem
Big Max
Bi-ocular
Blackhawk
Black Prince
Black Sheep
BL-C
Blue Grass
Blue Mallard
Bonocord
Breda
Brenneke
Brixia
Bronco
Browning
Brushmaster
B.S.A.
Buckbuster
Budget Power
Bulls Eye

Canuck
Cap-Chur Equipment
Cap-Ture
Cash
Castle
Catron
CCI
CD
Centaure
Centennial
Cesco
CH
Challenger
Champion
Charles Daly
Charles Harvan
Cherokee
Chuckster
C-I-L
Claybirder
C-Lect-Choke
Climax
Clipper King
Club
CM (with triangle)
CO_2 200
Cobra
Colt
Colt AR-15
Colt Buntline Special .45
Colt's Pt. F.A. Mfg. Co. Hartford Ct. USA
Combowad
Commanche
Commander
Commando
Comp
Compensator
Condor
Conetrol
Contender
Cooey
Co-op
Coral
Cordeau
Cordeau Bickford
Core-Lokt
Cougar
Crack Shot
Cranberry
Crosman
Croswood (and design)
Crown
Crown Prince
C.R.P.
Cub
Cutts
Cyclone
Cyclops

Daisy
Dakota
DBI
Deerslayer
Defender
Defiance
Detective Special
Diamondback
Diana
D-Mantel
Dominion
Double A
Double-Nine
Dread Naught
Dual-Core
Duo-Vent
DuPont
DuPont FNH
DuPont MX
DuPont NH
Dura-Matic
DWM
Dyna-Magic

EBL
E.C.
Economax
EIG
ELB
Eley Grand Prix
E. Remington
Escort
Excelsior
Explorer
Express
Ez Fit Grip
E-Z Loader
EZXS

Featherlight
Federal
Feltan-Bluestreak
Field
Fieldmaster
Field Trial

Finnbear
Fin'N Feather Club
Fire Ball
Fitwell
Fitz
Fitz Ammosafe
Flinch-X
Flite-King
Flite-Max
Flyermax
FN
Foil
Forester
Fox
Franzite
Fred Palmer's Positive Shooting
Frontier
Frontier Scout
Frontier Six Shooter
Fulton

Galahad
Galesi
Game Getter
Gamemaster
Gamemax
Garrett
Gebruder Merkel Suhl
Gevarm
Gevelot
Glenfield
Golden Pheasant
Gold-N-Line
Green Dot
Guardsman
Gun All
Gun-Caddy
Gun Guard
Gun-Ho
Gunleather
Gunslick
Gyro-Jet

H
H (and Design)
Hammer The Hammer
Handicap
Harvey .224 Kay-Chuck
Hawkeye
Hawkins
Hawthorne
H C Benjamin
Hellcat
Herco
Hercules Red Dot
Hercules 2400
Herter's
Hiawatha
Highway Patrolman
HIJ
Hi-Power
Hi-Shok
Hi-Skor
Hi-Speed
Hi-Standard
Hivel
HK
H-Mantel
Holland & Holland
Hoppe's
H & R Reising
Hudson Bay
Hunter
Huntsman
Husky
Husqvarna
Hycon
Hydro-Coil
Hy-Gun
Hymax

I.C.I.
Ideal
Imperial
Indian
Inner-Belted
Instinct Shooting
InterArmco
Interarms
Interlock
International
Ironsighter
Ithaca
Ithaca Gun
Ithaca Raybar
Iver Johnson

Javette
J. C. Higgins
Jeep
Jet
Jet-Away
Jetfire
JGR Gun Sport
Junior Special

K (w/concentric circles)
Kahles
Kahles of America
Kant-Splash
Kentucky Rifle Gunpowder
King
Klay Bird
Kleanbore
Kleen-Test
Knock-About
Kodiak
Krumble Ball
Kruzell
Kwik-Sert

Laflin & Rand
Lancer
LaSalle
Latigo
L.C. Smith
Leader
Leader in the Field
Lecco
Leupold
Levermatic
Life Saving Service
Lifetyme
Lightning
Little Atom
Llama
Longhorn
Lubaloy
Lub-Ra Seal
Lucky McDaniel
Luger
Lyman

Magiclick
Magnamax
Magna-Mount
Mag-na-port
Magnum
.357 Magnum
Mannlicher Schoenauer
Marauder
Marble's
Mark V
Mark XXII
Marksman
Marlin
Martial
Matador
Matchmaster
Match Target
Mauser
Mauser-Oberndorf
Max-Fire
Maxiflux
Maxifort
Max-Speed
MBT (and design)
Medalist
Mercury
M.F.A. Co.
Micro Choke
Micro-Groove
Midvale
Millett Sights
MiniMax
Minx
Mold-Tite
Monark
Monogrip
Monte Carlo
Moose Brand
Mossberg
Mountie
Multy-Choke
Musketeer
Mustang

N A Co.
Natchez
National Match
New Chief
New Club
New Rival
New Service
Nitro Club
Nitro Express
No Kick Coming
Non-Corr
Norka
Norma
Noroc
Nublack
Num-Rite
Nydar

O (and design)
Oerlikon
Officers Model
Official Police
O.F. Mossberg & Sons Inc.
O.K.H.
Old Reliable
Ol' Sarge
Olympic
Orange Extra
Organizer
Ozite

P (in a circle)
Pachmayr

TABLE XXIV
Directory of Suppliers

A

P.O. Ackley (custom barrels)
P.O. Box 17347
Salt Lake City, Utah 84117

The Adco Co. (quick loaders)
P.O. Box 6565
St. Paul, Minnesota 55106

Aimpoint USA Inc. (sights)
203 Elden St. Suite 302
Herndon, Virginia 22070

Allcock Mfg. Co. (Havahart traps)
North Water Street
Ossining, New York

Bob Allen Co. (shooting clothing)
211 Court Street
Des Moines, Iowa

Alley Supply Co. (collimators)
P.O. Box 458
Sonora, California

American Optical Co.
P.O. Box 1408
Philadelphia, Pennsylvania

Ammodyne Inc. (ammo)
Box 1859
Los Angeles, Calif. 90053

Amron Corp. (ammo)
525 Progress Avenue
Waukesha, Wisconsin 53186

Anderson Gun Shop (lens covers)
1203 South 3rd Avenue
Yakima, Washington

Apex Rifle Co. (rifles, barrels)
7628 San Fernando
Sun Valley, Calif. 91352

Armalite Inc. (AR rifles-shotguns)
118 East 16th Street
Costa Mesa, Calif. 92627

Armoury Inc. (accessories)
Rte. 25
New Preston, Conn. 06777

B

Bausch & Lomb Co. (scopes, mounts)
635 St. Paul Street
Rochester, New York 14602

Beckelhymer's (cases, grips)
Hidalgo & San Bernardo
Laredo, Texas 78040

Beeman Inc. (air guns)
9 Paul Drive
San Rafael, Calif. 94903

Behr-Manning Co. (oilstones)
Green & North Streets
Teterboro, New Jersey

Berns-Martin Co. (holsters)
Box 335
Elberton, Georgia 30635

Bianchi Holster Co.
212 W. Foothill Blvd.
Monrovia, Calif. 91016

Birchwood-Casey Co. (chemicals)
Eden Prairie, Minn. 55344

Packaged Power
Palma
Palomino
Parashoot
P. Beretta
Peacemaker
Peacemaker Six Shooter
Peerless
Pellgun
Peters
Peters Victor No. 12
PGS
Philip's
PIC
Plainsman
Plinkers
Plink-O-Matic
PMC The Californian
Pocket Positive
Police Positive
Police Positive Special
Poly Choke
Poly-Matic
Polyvent
Pony
Posse
Powerlet
Power-Lokt
Power-Matic
Power-Point
Power Without Powder
Pow-R-Set
Precisioneered
Presentation Model
Pro-7
Protecto Kaddy
Puma
Pyrodex
Python

Quails Fargo
Quickie

R (on a shield)
Ram-Jet
Ram Line
Rangemaster
Ranger
Raybar
RCBS
Rebel
Rec-O-Chek
Redfield Precision
Red Head
Redi Rest
Red-Jet (and design)
Regent
Reloder
Remington
Rem UMC
Repeater
Revelation
RG
Rifle Ranch
Rifle Sport
Rig
Rig-Rod
Ring-Waxed
Romax
Rossi
Roto Forged
Ruby
Ruger
RWS
RWS-Magnum

S (within a design)
Sable
SAC (and design)
S. A. Co.
Saddlegun
Safari
Sako Finland
Samson
Sarasqueta
Savage
Savage Quality (and design)
Scoremaster
Scout
Sears
Secs Plastic Ammo (with design)
Sedgley
Selby
Sentinel
Shell Cracker
Shellmaster
Shell Pac
Shirtpocket
Shooting Master
Side-Kick
Sierra
Sig
Silver Bear
Silver Jet
Silvertip
Single-Six
SKB
Skeetmax
Skeet "N" Field
Skoda
Skyshooter
Slugster
Smith & Wesson
Sniper
Sourdough
Spartan
Spatterpruf
Specialty
Speedies
Speedmaster
Spit
Spitfire
Sport-King
Sportmaster
Sportsman
Sportsways
SPR
SR (intertwined)
Stag
Stagecoach
Standard
Star (and design)
Starlet
Staynless
Stayset
Stevens
Steyr
Stinger
Stingray
Stoeger
Storm King
Stowline
Stun Safe
Submachine Gun (and design)
Sunspot
Super (imposed on an X)
Super B-B
Super BB Repeater
Super "C"
Supercleen
Superflash
Super Kant-Splash (on Y)
Supermag
Super Match
Super-Match X (and design)
Supermatic
Supermatic Citation
Supermatic Tournament
Supermatic Trophy
Supersingle
Super Speed
Super .38 Automatic
Super-X
Super X (and design)
Supreme
Sure Grip
SW
Swag-O-Matic

Tack-Hole
Tackhole Dot
Targ-Dots
Target
Targeteer
Target Grip
Targetmaster
Targo
Tasco
Tecto
Ted Williams
Ten-O-Grip
Texan
Texas Ranger
Texload
The Bulletsmiths
The Colteer 1-22
The Frontier
The Minuteman
The Original Sight-Exchange
The Peacemaker
The Royal
The Sign of a Marlin
The Woodsman
Thompson (and design)
Thunderbolt
Titan
Tommy
Tomorrow's Rifles Today
Top Notch
Topper
Tradewinds

Trap
Trapmaster
Trapmax
Tri-Clad
Trim-Tru
Tri-Test
Tround
Truaim
Truflite
Tru-Lock
TRW
T-Wad
TW Fortuna-Suhl
Twistite

U
U (in a circle)
Ultramax
Ultrarifled
Ultra-Vibe
U.M.C.
U.M.C. (in an oval)
Undercover
Unique
Uni-Seal
Uzi

Val-Keen
Valmet
Valor (on shield)
Vandalee
Vari-Choke
Varminter
Varmint King
Varmintmaster
Verelite
Victor
Vironda
Vixen
Vom Hofe
Vostok

W
W (with EZXS, LEADER or SPATTERPRUF)
W (with RANGER superimposed)
W (with SUPER SPATTERPRUF)
W (with superimposed WINCHESTER)
Walther (and design)
Wanda
W&C Scott & Son
Weapons Wear
Weatherby
Weaver Choke
Weaver Scope
Webley
Western
Western (and design)
Western Field
Wetproof
WFS (and design)
White Flyer
W SUPER-SPEED (with design)
White Line
Whitney
Whiz-Bang
Winchester
Wingmaster
Win-Lite
Win-Wad
Woodmaster
WP (in an oval)
W.R.A. Co.

XL
"X-L"
Xpert

Yama Wood

Z (in concentric circles)
Zephyr

E. C. Bishop & Son (gunstocks)
P.O. Box 7
Warsaw, Missouri 65355

Bo-Mar Tool & Mfg. Co. (sights)
Box 168
Carthage, Texas 75633

Bonanza Sports Mfg.
412-1 Western Avenue
Faribault, Minn. 55021

Boyt Co. (leather goods)
Box 1108
Iowa Falls, Iowa 51026

Brauer Bros. Mfg. Co. (cases)
817 N. 17th Street
St. Louis, Missouri 63106

B. L. Broadway (machine rest)
1503 Jasper
Chula Vista, Calif. 92011

Bob Brownell's (gunsmiths sup.)
3rd & Main
Montezuma, Iowa 50171

Browning Arms Co. (firearms)
Rt. 1
Morgan, Utah 84050

J.M. Buckheimer Co. (holsters)
Airport Road
Frederick, Maryland 21701

Maynard P. Buehler Inc. (mounts)
17 Orinda Highway
Orinda, Calif. 94563

Bushnell Inc. (scopes, mounts)
2828 E. Foothill Blvd.
Pasadena, Calif. 91107

C

Canjar Rifle Acc. Co. (triggers)
500 East 45th Street
Denver, Colorado 80216

Charter Arms Corp. (handguns)
265 Asylum
Bridgeport, Conn. 06610

C-H Tool & Die Co. (loading tools)
106 North Harding Street
Owen, Wisconsin 54460

C-I-L Ammunition Inc.
Div. Canadian Industries
P.O. Box 831
Plattsburgh, New York 12901

Colorado School of Trades (gun'sthg)
1575 Hoyt Street
Denver, Colorado 80215

Colt's Mfg. Co. (firearms)
150 Huyshope Avenue
Hartford, Conn. 06102

Conetrol Inc. (mounts)
Hwy 123
Sequin, Texas 78155

Crosman Air Guns
980 Turk Hill Road
Fairport, New York 14450

D

Daisy Mfg. Co. (air guns)
Rogers, Arkansas 72756

Dinsmore Shooting Glasses
Box 21
Wyomissing, Penna. 19610

Dixie Gun Works Inc. (muzzleloading)
Gunpowder Lane
Union City, Tennessee 38261

Douglas Barrels Inc.
5504 Big Tyler Road
Charleston, West Virginia 25312

E

Eder Instrument Co. (borescope)
2293 N. Clybourn
Chicago, Illinois 60614

Ellison Cabinet Shop (benches)
P.O. Box 246
Lockhart, Texas 78644

EMF Co. Inc. (guns, parts, acc.)
1900 E. Warner Avenue
Santa Ana, Calif. 92705

F

Reinhart Fajen Inc. (stocks)
P.O. Box 338
Warsaw, Missouri 65355

Federal Cartridge Co. (ammo)
2700 Forshay Towers
Minneapolis, Minn. 55402

Fitz Inc. (grips)
Box 49797
Los Angeles, Calif. 90049

Flaig's (gunsmithing)
Babcock Blvd. Thompson Run Rd.
Millvale, Penna. 15209

Forster Products (reloading tools)
81 E. Lanark Avenue
Lanark, Illinois 61046

Fowler Shooter's Supply (vaults)
Box 6421 — ATS
Midland, Texas 79701

Freeland's Scope Stands Inc.
3737 14th Avenue
Rock Island, Illinois 61201

G

Gunline Tools (checkering tools)
2970 Saturn Street (F)
Brea, Calif. 92621

H

Harrington & Richardson Co.
Park Avenue
Worcester, Mass. 01610

Harris Engineering Inc. (bipods)
Barlow, Kentucky 42024

Heatbath Corp. (blueing eq.)
P.O. Box 2978
Springfield, Mass. 01101

Herrett's (grips)
741 — A9
Twin Falls, Idaho 83301

High-Standard Mfg. Co.
1817 Dixwell Avenue
Hamden, Conn. 06514

B.E. Hodgdon Inc. (gun powder)
7710 W. 50 Hwy
Shawnee-Mission, Kansas 66202

Hopkins & Allen Co. (muzzleloading)
3 Ethel Avenue
Hawthorne, New Jersey 07507

Frank A. Hoppe Co. (cleaning eq.)
Box 97
Parkersburg, Penna. 19365

Hornady Mfg. Co. (bullets)
P.O. Box 1848
Grand Island, Nebraska 68802

The Hunter Co. (holsters)
1215 12th Street
Denver, Colorado 80204

I

Ithaca Gun Co. (firearms)
Terrace Hill
Ithaca, New York 14850

J

Iver Johnson Arms Inc. (firearms)
2202 Redmont Road
Jacksonville, Arkansas 72076

Phil Judd Co. (swivels)
83 East Park Street
Butte, Montana 59701

K

Kolpin Bros. Co.
Box 231
Berlin, Wisconsin 54923

L

George Lawrence Co. (leather goods)
Portland, Oregon 97204

Lee Precision Inc. (loading tools)
4275 Highway U
Hartford, Wisconsin 53027

Leupold & Stevens Inc. (scopes)
P.O. Box 688
Beaverton, Oregon 97075

Lyman Products Co. (sights, tools)
Route 147
Middlefield, Conn. 06455

M

Marble's Arms Co. (sights, acc's)
P.O. Box 111
Gladstone, Michigan 49837

Marlin Firearms Co. (firearms)
100 Kenna Drive
North Haven, Conn. 06473

Mayville Engineering Co. (loading tools)
Mayville, Wisconsin 53050

Merit Gunsight Co.
P.O. Box 995
Sequim, Washington 98382

Michaels of Oregon (swivels)
P.O. Box 13010
Portland, Oregon 97213

Micro Sight Co. (sights)
242 Harbor Blvd.
Belmont, Calif. 94002

Millett Sights
16131 Gothard Street
Huntington Beach, Calif. 92647

Mitchell Shooting Glasses
Box 539
Waynesville, Missouri 65583

Frank Mittermeier Inc. (inletting tools)
3577 East Tremont Ave.
Bronx, New York 10456

Modern Gun Repair School
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Phoenix, Arizona 85006

O.F. Mossberg & Sons Inc.
7 Grasso Avenue
North Haven, Conn. 06473

Mustang Pistol Grips
13830 Hiway 395
Edgemont, Calif. 92508

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New Field Indus. Inc. (speed loaders)
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Cortland, Ohio 44410

Norma-Precision Inc. (ammo)
South Lansing, New York 14882

Nosler Bullets Inc.
P.O.Box 688
Beaverton, Washington 97075

Numrich Arms Co. (gun parts)
West Hurley, New York 12491

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Oehler Research Inc. (chronograph)
P.O. Box 9135A
Austin, Texas 78766

Omark-CCI Inc. (ammo)
Box 856
Lewiston, Idaho 83501

Outers Laboratories Inc.
Box 37
Onalaska, Wisconsin 54650

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Pachmayr Inc. (grips, acc's)
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Los Angeles, Calif. 90015

Pacific Tool Co.
Box 4495
Lincoln, Nebraska 68504

C.R. Pedersen & Son (Sha-cul)
Ludington, Michigan 49431

Pennsylvania Gunsmiths School
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Avalon
Pittsburgh, Penn. 15202

Polychoke Co. Inc. (chokes, ribs)
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Hartford, Conn. 06101

Precise Import Co.
3 Chestnut
Suffern, New York 10901

P.S. Sales
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Chapel Hill, No. Carolina 27515

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Ranging Measurements Systems
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Redfield Co. (sights, scopes)
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Remington Arms. Co.
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Martin B. Retting Inc. (acc's)
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Rig Products Co. (scoring plugs)
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Russell's Arkansas Oilstones
P.O. Box 474
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SAECO (loading tools)
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Saf-T-Case (hard gun cases)
P.O. Box 5472
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Sanderson Custom Pistol Stocks
17695 Fenton
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San Francisco Gun Exchange
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San Francisco, Calif. 91403

Savage Industries (firearms)
Westfield, Mass. 01085

Shilen Rifles Inc.
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Ennis, Texas 75119

Sierra Bullets
10532 S. Painter Avenue
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Sigma Eng. Co. (ear-valvs)
11320 Burbank Blvd.
No. Hollywood, Calif. 91601

Smith & Wesson Inc.
Springfield, Mass. 01101

Springfield Armory (M-1 rec'vrs)
420 West Main Street
Geneseo, Illinois 61254

Sterling Arms Co. (firearms)
2206 Elmwood Avenue
Buffalo, New York 14216

Sturm, Ruger & Co. Inc.
1 Lacey Place
Southport, Conn. 06490

Swift Instruments Co.
952 Dorchester Ave.
Boston, Mass. 02125

T

Tasco Inc. (scopes, mts)
P.O. Box 520080
Miami, Florida 33152

Ten-Ring Mfg. Co. (target acc.)
Box 157
New City, New York 10956

Thompson/Center Arms (muzzlel'dg)
Farmington Rd. Box 2426
Rochester, New Hampshire 03867

Triple-K Mfg. Co. (parts, leather)
568 6th Ave.
San Diego, Calif. 92101

Trius (target throwers)
Box 25
Cleves, Ohio 45002

U

John Unertl Optical Co.
3551-5 East Street
Pittsburgh, Pa. 15215

V

Valmet S.G. Div.
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Elmsford, New York 10523

W

Williams Gun Sight Co.
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Davison, Michigan 48423

Weatherby Inc.
2781 Firestone Blvd.
South Gate, Calif. 90280

W.R. Weaver Co. (scopes, mts)
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El Paso, Texas 79915

Dan Wesson Arms Co.
293 S. Main Street
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Willson Products Co. (glasses)
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Winchester Repeating Arms Co.
New Haven, Conn. 06504

Winchester-Western Co. (ammo)
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Lititz, Penna. 17543

TABLE XXV

SIGHTING-IN CHARTS

(Reprinted Courtesy of Bausch & Lomb Co., Rochester, N.Y.)

The following tables indicate the most desirable zeroing range for each caliber. Mid-range trajectory and maximum point-blank range are also shown.

Cartridge	Bullet Weight in grains	Bullet Type	Maximum Point Blank Range	Height Above Center on Target at 100 Yds. in inches	Recommended Zero Distance in Yards
.218 Bee	46	HP, OPE (HP)	226.2	2.8	199.3
.22 Hornet	45	SP, HP	216.1	2.9	190.2
.22 Hornet	46	OPE (HP)	216.1	2.9	190.2
.22 Jet CF Mag.	40		196.3	3.0	172.8
.22 Long Rifle	36	HP	127.6	1.2	109.7
.22 Long Rifle	36	LEAD	126.8	1.1	108.8
.22 W.R.F. (Rem. Spe.)	45	LEAD	135.0	1.7	115.9
.220 Swift	48	SP, PSP	333.2	1.9	294.5
.222 Remington	50	HPPL	273.3	2.5	238.6
.222 Remington	50	PSP, MC	269.3	2.5	235.6
.222 Remington Mag.	55	HPPL	286.7	2.4	249.9
.222 Remington Mag.	55	PSP	282.6	2.4	246.7
.22-250 Remington	55	HPPL	328.4	2.1	287.8
.22-250 Remington	55	PSP	319.9	2.1	280.6
.22-250 Weatherby	55	PT-EX	317.6	2.1	278.3
.223 Remington	55	HPPL	286.7	2.4	249.9
5.6mm Remington	55	PSP	282.6	2.4	246.7
6mm Remington	80	PSP, HPL	315.8	2.2	274.7
6mm Remington	100	PSP, SPCL	304.5	2.4	262.1
.224 Weatherby Varmint	50	PT-EX	308.0	2.2	271.2
.224 Weatherby Varmint	55	PT-EX	312.4	2.2	273.0
.225 Winchester	55	PSP	312.0	2.2	272.6
.240 Weatherby Mag.	70	PT-EX	334.4	2.1	293.5
.240 Weatherby Mag.	90	PT-EX	318.5	2.2	276.5
.240 Weatherby Mag.	100	PT-EX	321.3	2.3	277.7
.243 Winchester	75	HP	308.8	2.3	268.8
.243 Winchester	80	PSP	313.6	2.3	272.0
.243 Winchester	80	HPPL	314.9	2.3	273.5
.243 Winchester	100	PSP, CL, PP(SP)	292.8	2.5	251.7
.244 Remington	75	PSP, HP	308.8	2.3	268.8
.244 Remington	90	PSP	294.3	2.4	254.5
.25-20 Winchester	60	HP, OPE	186.7	3.0	163.4
.25-20 Winchester	86	LEAD, SP, L	139.1	1.9	119.5
.25-35 Winchester	117	SPCL	212.6	3.0	183.5
.25-35 Winchester	117	SP	208.3	3.0	180.4
.250 Savage	87	PSP	276.8	2.6	239.3
.250 Savage	100	PSP	263.0	2.7	227.0
.250 Savage	100	SPCL	247.0	2.7	214.6
.250 Savage	100	ST (EXP)	258.5	2.7	223.5
6.5mm Remington Mag.	120	PSPCL	287.4	2.5	247.6
.256 Winchester Mag.	60	OPE	221.0	2.8	194.4
.257 Roberts	87	PSP	292.3	2.4	253.0
.257 Roberts	100	ST (EXP)	265.3	2.6	229.5
.257 Roberts	117	PP (SPL), SPCL	241.5	2.8	209.0
.257 Weatherby Mag.	87	SP	325.3	2.1	284.8
.257 Weatherby Mag.	100	SP	320.6	2.2	278.4

TABLE XXV, Continued

Cartridge	Bullet Weight In grains	Bullet Type	Maximum Point Blank Range	Height Above Center on Target at 100 Yds. in Inches	Recommended Zero Distance In Yards
.257 Weatherby Mag.	117	RN	297.9	2.4	258.0
.264 Winchester Mag.	100	PSPCL	327.3	2.1	285.4
.264 Winchester Mag.	140	PSPCL	307.4	2.4	264.3
.270 Weatherby Mag.	100	SP	323.6	2.1	283.1
.270 Weatherby Mag.	130	SP	314.0	2.3	271.3
.270 Weatherby Mag.	150	RN	299.7	2.4	259.0
.270 Weatherby Mag.	150	SP	306.5	2.4	264.2
.270 Winchester	100	PSP	310.6	2.3	270.0
.270 Winchester	110	SPP	307.6	2.4	265.2
.270 Winchester	130	PP, SP, PP (EXP), SP, BT, BP	301.5	2.5	259.3
.270 Winchester	130	ST (EXP), IBPSP, PSPCL, HPBT	296.9	2.5	255.8
.270 Winchester	130	FJBT	310.3	2.4	266.0
.270 Winchester	150	PP, SP	276.8	2.6	238.0
.270 Winchester	150	IBSP, SPCL	257.5	2.7	222.5
.270 Winchester	150	SPPBT, FJP	278.6	2.7	238.4
.280 Remington	125	PSPCL	298.7	2.4	257.7
.280 Remington	150	PSPCL	281.8	2.6	242.1
.280 Remington	165	SPCL	264.0	2.7	227.7
.284 Winchester	125	PP (SP)	298.7	2.4	257.8
.284 Winchester	150	PP (SP)	276.8	2.6	238.0
7mm Mauser	139		252.0	2.8	215.4
7mm Mauser	175	SP	232.5	2.9	200.6
7mm Remington Mag.	150	PSPCL, PP (SP)	308.4	2.4	265.7
7mm Remington Mag.	175	PSPCL	299.7	2.5	257.1
7mm Remington Mag.	175	PP (SP)	282.5	2.5	244.2
7mm Weatherby Mag.	139	PT-EX	310.3	2.4	267.6
7mm Weatherby Mag.	154	SP	302.0	2.4	259.7
7mm Weatherby Mag.	175	RN	290.4	2.5	250.2
.30 Carbine	110	SP, HSP	175.4	2.9	152.2
.30 Remington	170	ST (EXP)	202.1	3.0	173.4
.30 Remington	170	IBSP, MCL, SPCL	206.8	3.0	178.4
.30-06 Springfield	110	PSP (WIN)	284.3	2.4	248.6
.30-06 Springfield	110	PSP (REM)	287.9	2.4	251.4
.30-06 Springfield	125	PSP	290.9	2.5	251.6
.30-06 Springfield	130	SPPBT, FJBT	303.7	2.4	262.6
.30-06 Springfield	150	BP	285.1	2.6	245.1
.30-06 Springfield	150	PP (SP)	273.1	2.6	236.1
.30-06 Springfield	150	ST (EXP) PSPCL	279.8	2.6	241.2
.30-06 Springfield	180	BP	264.4	2.7	226.7
.30-06 Springfield	180	PP (SP)	249.9	2.7	216.8
.30-06 Springfield	180	SPCL	246.5	2.8	213.2
.30-06 Springfield	180	ST (EXP)	266.0	2.7	228.9
.30-06 Springfield	180	PSPCL	262.6	2.7	225.4
.30-06 Springfield	180	FMCBT, MCTH	269.6	2.7	230.5
.30-06 Springfield	180		257.7	2.7	221.8
.30-06 Springfield	220	PP (SP) SPCL	228.4	2.9	196.6
.30-06 Springfield	220	ST (EXP)	235.1	2.9	201.6
.30-30 Winchester	150	SPCL	212.9	3.0	184.9
.30-30 Winchester	150	OPE, PP, ST	218.1	2.9	188.9
.30-30 Winchester	160	MC	205.0	3.0	177.0
.30-30 Winchester	170	HPCL, SPCL	206.8	3.0	178.4
.30-40 Krag	180	SPCL, PP (SP)	227.9	2.9	196.8
.30-40 Krag	180	PSPCL, ST (EXP)	241.4	2.9	207.1
.30-40 Krag	220	ST (EXP)	212.3	3.0	181.3

TABLE XXV, Continued

Cartridge	Bullet Weight in grains	Bullet Type	Maximum Point Blank Range	Height Above Center on Target at 100 Yds. in Inches	Recommended Zero Distance in Yards
.300 Savage	150	PSPCL, ST (EXP)	253.6	2.8	218.4
.300 Savage	150	PP (SP)	249.0	2.8	214.9
.300 Savage	150	SPCL	240.5	2.8	208.4
.300 Savage	180	PSPCL, ST (EXP)	232.8	2.9	199.6
.300 Savage	180	SPCL, PP (SP)	220.3	2.9	190.2
.300 H. & H. Magnum	150	ST (EXP)	297.7	2.4	257.0
.300 H. & H. Magnum	180	ST (EXP)	281.8	2.6	242.1
.300 H. & H. Magnum	220	ST (EXP)	253.2	2.8	217.4
.300 Weatherby Mag.	110	SP	351.6	1.9	311.7
.300 Weatherby Mag.	150	SP	326.3	2.2	283.1
300 Weatherby Mag.	180	SP	308.6	2.4	265.6
.300 Weatherby Mag.	220	RN	276.7	2.6	237.9
.300 Winchester Mag.	150	PP (SP) PSPCL	312.5	2.3	270.6
.300 Winchester Mag.	180	PP (SP) PSPCL	300.3	2.5	257.5
.300 Winchester Mag.	220	ST (EXP)	264.5	2.7	227.1
7.65 Argentine	150	SPP	275.9	2.6	237.7
.303 British	180	PP (SP) SPCL	246.7	2.8	211.6
.303 British	215	SP	220.6	2.8	192.2
.303 Savage	190	ST (EXP)	186.8	3.0	160.9
.303 Savage	180	SPCL	199.3	3.0	171.9
.308 Norma Magnum	180	NDC	303.0	2.5	260.0
.308 Winchester	110	PSP	283.1	2.4	247.4
.308 Winchester	125	PSP	285.2	2.5	246.3
.308 Winchester	150	PP (SP)	264.2	2.7	228.3
.308 Winchester	150	ST (EXP) PSPCL	270.4	2.7	233.0
.308 Winchester	180	PP (SP), SPCL	239.4	2.8	206.9
.308 Winchester	180	ST (EXP), PSPCL	254.7	2.8	218.5
.308 Winchester	200	ST (EXP)	237.0	2.9	203.6
8mm Mauser	170	SPCL, PP (SP)	228.7	2.9	198.4
.35 Remington	200	IBHP, IBSP, MCL, SPCL, HPCL	201.3	3.0	174.1
.350 Remington	200	PSPCL	254.8	2.8	219.7
.350 Remington	250	PSPCL	235.6	2.9	202.1
.351 Winchester	180	SP, FMC	175.0	2.9	150.7
.358 Norma Magnum	250	SPSP	263.7	2.7	227.0
.358 Winchester	200	ST (EXP)	235.3	2.9	203.3
.358 Winchester	250	ST (EXP)	217.6	3.0	187.0
.375 H. & H. Magnum	270	PP (SP)	260.9	2.7	224.4
.375 H. & H. Magnum	300	ST (EXP)	243.9	2.8	209.7
.375 H. & H. Magnum	300	FMC, MC	232.6	2.9	201.3
.375 Weatherby Mag.	270	RN	274.1	2.6	236.0
.375 Weatherby Mag.	300	RN	263.1	2.7	226.3
.378 Weatherby Mag.	270	RN	298.0	2.4	257.0
.378 Weatherby Mag.	300	RN	276.5	2.6	237.9
.38-40 Winchester	180	SP	127.8	1.2	109.7
.38-55 Winchester	255	SP	133.2	1.5	113.6
.44 Remington Mag.	240	HSP, SP	157.8	2.7	136.5
.444 Marlin	240	SP	201.6	3.0	176.4
.44-40 Winchester	200	SP	125.9	1.0	108.1
.45-70 Government	405	SP	133.2	1.5	113.6
.458 Winchester Mag.	500	FMC, SP	208.1	3.0	178.6
.458 Winchester Mag.	510	SP	201.9	3.0	173.8
.460 Weatherby Mag.	500	RN	246.3	2.8	213.1

TABLE XXVI
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